

STATE AND INDIGENOUS MEDICINE IN NINETEENTH-
AND TWENTIETH-CENTURY BENGAL: 1800-1947

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DECLARATION

I hereby declare that this thesis has been composed by myself and that the work is my own, unless otherwise stated. None of it has been submitted for any other degree or other professional qualification.

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6 October 1987.

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ABBREVIATIONS

N.M.I.	-	Native Medical Institution
I.M.S.	-	Indian Medical Service
N.A.I.	-	National Archives of India
GOB	-	Government of Bengal
GOI	-	Government of India

A B S T R A C T

The thesis examines medical education and medical policies in British Bengal over the period 1800 to 1947. The material for this was gathered from the Libraries and Archives in Edinburgh, London, Calcutta and Delhi.

The thesis starts with an outline of indigenous medicine in ancient and medieval India. It examines the nature of relationship between ruling authorities and the growth of the Ayurvedic and Unani systems of medicine. Although medicine in India was, by the time of British rule, represented as a set of static rituals and practices, the history of medicine was, in reality, a history of accommodation and change, frequently associated with invasion or changes in rulers.

The remainder of the thesis examines the impact of British rule and British medicine as the last of a series of major challenges facing Indian medicine. The period is one in which western medicine, in particular, medicine in Britain, was changing and professionalising. Thus, much of the thesis concerns attempts to professionalise medicine in India where competition and accommodation between the different forms of medicine were a primary consideration.

Initially, it seemed possible that the two systems of medicine could live in peaceful co-existence and mutual accommodation, but gradually, with professional pressure from Britain and State sanctioning in India, western medicine moved to a dominant position in State provision of medical services. By the end of the nineteenth century, advances in western medicine undermined the similarities of theory and practice which, earlier, made extensive co-operation seem at least a possibility.

Western medicine, in common with other professions in India, required facilities and education in English. These were concentrated in Bengal in an elite section of the community, commonly known as the Bhadralok. Ironically, but perhaps not surprisingly, this section of the community not only experienced the greatest advantage in their relationship with the British State in India, but, as the best-educated and articulate section of the community, was most active in the growing nationalist movement from the end of the nineteenth century. They dominated medical education but were receptive to the idea of the regeneration and promotion of indigenous forms of medicine. In these circumstances, western medicine never achieved a total dominance and by the end of the period, medical education in Bengal contained aspects of both systems.

Social and religious conditions in India were vastly different from those in Britain and, to a large extent, the failure of western medicine to achieve the sort of professional dominance common in Britain, is hardly surprising. State policies were formed to serve commercial and administrative purposes but these did not always coincide with the interests of either the indigenous population or of medical practitioners. Thus, as with earlier periods, medicine in the period under study has to be understood in terms of competition and accommodation.

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4. Asiatic Society and Bengal Secretariat Library, Calcutta.

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C H A P T E R I

INTRODUCTION

The study assesses the impact of the State on medicine in nineteenth- and twentieth-century India . To explore this relationship within a manageable context, the principal emphasis is upon Bengal.

Bengal has not been explored in as much detail as other parts of India (for example, Punjab: Hume, 1977),¹ though the beginnings of State support to indigenous medicine are to be found there. Concomitantly, the interaction between the State and medicine is most obviously seen in the policies carried out here. A unique feature of the social structure of Bengal is the existence of the three upper castes - Brahmins, Kayasthas and Baidyas, together called the Bhadralok. They formed the dominant group in British Bengal in western medicine as, in other fields.

In British India, Calcutta was the first important centre of trade and commerce, followed by Madras and Bombay. These three centres were the first to become subject to western influence and cultural interaction.²

Following the British victory at the Battle of Plassey in 1757,³ the East India Company deputed Clive to stabilize its affairs in Bengal. In 1765, he secured from the Mughal emperor, the Diwani (the right of collecting the revenue) of Bengal, Bihar and Orissa. This gave the Company the right to control the entire revenues and civil administration of these provinces. The Regulating Act of 1773 established Calcutta as the seat of the Company's central government and the headquarters remained there until 1912 when they were transferred to Delhi. It was again in Bengal that a regular system of district administration was first evolved and perfected. For these reasons, Calcutta was the first among the Indian towns to become effectively influenced by European ideas and institutions.

British State and its Impact on Indian Society - some viewpoints

Until recently, writings on the impact of British conquest of India shared one feature - they focused on the adverse effects of imperialist policies on the culture and society of India. The lack of development in India is often linked with unfavourable policies of the British. Many believe that it was not until World War I that imperial policies expressed concern for the Indian masses. Pressure for change was due largely to nationalists during this period.⁴ Among nationalists, the near unanimous claim is that the decline of traditional culture, science and religion, was a result of the adverse consequences of foreign rule. This prompted them to move

in favour of reviving the indigenous heritage.⁵ The rise of the anti-imperialist movement was, thus, a gradual outcome of the contradiction between the imperatives of colonial policy and the basic interests of a vast majority of the people of India. The so-called national movement embraced different classes and groups of people.⁶

Since indigenous medical knowledge was linked with the culture of the past, the move to resuscitate the Ayurveda and Unani could be seen as a part of the rising national consciousness. Professional associations were formed as a reaction to the 'loss' of government support for Indian medicine.⁷ The movement received considerable support from the Indian National Congress in the first two decades of the twentieth century which passed resolutions in favour of the promotion of Indian medicine.⁸

Apologies for Empire are now uncommon. Other arguments view India as a stagnant society prior to the advent of the British, thus placing the latter as active agents of change in Indian society.⁹ Evidence for the first part of this argument is sketchy. The indicators of stagnation are scarce. It may be argued that 'stagnation' of Indian society became apparent following the imposition of an 'alien' culture with its vastly different style of life. 'Stagnation', then, may have been a relative criterion for judging the state of Indian society in the pre-British period. There certainly was change, but whether or not it acted upon a 'stagnant' society is less clear.

The introduction of foreign industries and railway networks are taken by Kumar¹⁰ as the instruments of positive change. The establishment of the Public Works Department by British rulers, which took over the responsibility for civil buildings, roads, canals, and irrigation works might, by the same token, be seen as contributing to the improvement of social conditions in British India.

Charlesworth¹¹ in his recent work, British Rule and the Indian Economy, has discussed the commercial and economic relationships of British rulers with India. The rise of critical literature on the British impact on India, focusing mainly on Indian economic history, forms an important issue in his work. Dutt¹² and Digby,¹³ he argues, for instance, emphasized the negative effect of imperialism on Indian economy - that of "subversion of India to British imperial needs" - arising from the burden of land taxation on agriculture. In contrast, Griffiths'¹⁴ claim of British rule as a positive force of modernisation and industrialisation bears close resemblance to that of Marx¹⁵ who commented on the powerful and intrusive effect of imperialism on the Indian economy.

Indigenous medicine was inter-woven with social and religious practices. To many colonial administrators and western medical practitioners, it was 'stagnant' and 'inefficacious'. However, especially in the earlier period of British rule, it had its

supporters among British scientists and medical men. Until the late nineteenth century, little distinguished the theoretical basis of the two forms of medicine, and most commentators are agreed that the dominance of western medicine in prestigious and well-paid areas of practice was due to State patronage. Keswani¹⁶ and Majumdar¹⁷ argue that indigenous medicine declined for want of extended official patronage which went more strongly in favour of western medicine during the second quarter of the nineteenth century. The decay of Indian medicine, as Majumdar puts it, was due to

"the greater importance attached to western medicine introduced in this country during the British rule".¹⁸

That indigenous medicine survived was largely due to the continuation of the popular support it had received through the ages.

Banerji argues that colonial influence on indigenous medicine was far worse than mere neglect. He writes,

"Not only were the masses denied the benefits of western medical science but the total disruption of their way of life was brought about by the destruction of the already existing health practices".¹⁹

The decline of Indian medicine, he argues, went alongside the destruction of Indian culture and tradition.

Both Gupta and Arnold hold a similar opinion on the consequences of official patronage. British policy, as Gupta²⁰ sees it, initially, was to allow indigenous and western medical systems to flourish simultaneously. Gradually, however, opposition to indigenous medicine grew, and insofar as it was incorporated within the system of medical training and practice established by the colonial authorities, it was a very junior partner.

In 1822, the Native Medical Institution was established where instruction in indigenous medicine in native languages was carried out alongside that in western medicine. This was the first organised effort by the British State to provide medical instruction to the indigenous population.²¹ However, after years of controversy, these classes were discontinued in 1835 and instruction henceforward was to be in the medium of English. This was not the end of instruction in local languages or of indigenous medicine as an element in the curriculum, but it was a severe blow which set the direction for future policy.

Arnold²² views the shift as an assault on the corpus of knowledge of indigenous medical science. The policy laid bare the implicit attitude of the British which, he claims, was one of maintaining control over the Indian population by "dismissing indigenous medicine as mythological".²³

In discussing the State and medicine in British India, a consideration of the relationship in earlier periods is valuable. Chattopadhyaya's recent work, Science and Society in Ancient India,²⁴ is useful here. It opened up a new vista on the development of medicine. Chattopadhyaya convincingly demonstrates that the halcyon portrait of the Ayurveda synergetically related with religion and politics in ancient India, as portrayed in many books of history and countless lores, is dubious. He argues that medical practices contained in the Ayurveda were met in ancient India by determined opposition. Ayurvedic physicians were damned by the ruling orthodoxy which found expression in the legal and priestly literature. The social and religious pressure led scientists to concede to the law-givers in order to evade censorship. This they did by producing medical texts with an underlining of religious ideas. To quote Chattopadhyaya,

"to add apparent conviction to its loyalty to the norm of orthodox piety, special chapters are added to the text [Caraka-Samhita, for instance], for loudly proclaiming the theory of soul and its salvation".²⁵

Indian medicine was not a static set of rituals and practices revealed at one time, but the result of continued contest and accommodation through centuries of conquest and consolidation. Chapter II considers the substance of this process of development in greater detail. It examines the nature of State patronage in the following terms: a] who were the famous practitioners in ancient and medieval India who were actually patronised by the ruling courts?;

b] what famous texts were written, and were they patronised or proscribed by the State?; c) did the State persecute the physicians of the time? With the advent of British rule in India came the medicine of the West. The rest of the thesis, thus, discusses the series of policies made by British administrators in reaction to the medical systems of ancient and medieval periods.

In Chapters III and IV, I have traced the development of the relationship between indigenous and western systems of medicine. The initial policies favoured utilization of indigenous drugs and encouraged training and employment of indigenous medical practitioners. This was facilitated by the similar basis of diagnosis and treatment in the Indian and Western medical sciences.

Policies towards indigenous medicine changed with the increasing divergence in the two medical systems towards the late nineteenth century. At this stage, State attempts were made to professionalise and move in favour of western medicine which, Chapter IV argues, failed because of the heterogeneous nature of the medical profession. In Chapter V, I have argued that the professionalisation of medicine in Britain was advanced by the spectacular successes in public health policies. No similar successes were found in the Indian context.

The narrow scope of the State's objectives, lack of etiology of disease and of sensitivity of social conditions were the main causes

of such a failure. The absence of public health achievements probably affected the success of western medicine in its struggle with indigenous forms of medicine, and limited the likelihood of full professionalisation.

In the concluding phase of our work, I have shown that the spread of western medical education with the support of the State was limited to a small section of the Indian community - the wealthy Bhadralok. Their attachment to western medicine was concerned with social advantage and social status. With the rise of the nationalist movement, they proved to be flexible and accommodating for indigenous forms of medicine. At the same time, indigenous medicine became less attached to rituals and more open to experimentation and research.

Throughout our discussion, I have used the term 'western' medicine to denote the medical system of the West as existent in Britain at the time. A 'medical system' includes the system of health-care delivery. On the definition of health, the World Health Organisation writes, it is

"a state of complete physical, mental and social well-being, and not merely the absence of disease".²⁶

It is, however, difficult to formulate a satisfactory definition of health, for conditions may be regarded as healthy in one society and unhealthy in another. For our purpose, we may agree with

Wilson's²⁷ definition which outlines the "idea of health as functional competence in enacting roles". Illness, as opposed to health, according to Parsons, is a "state of disturbance in the 'normal' functioning of the total human individual, including both the state of the organism as a biological system and of his personal and social adjustments".²⁸

It is thus partly biologically and partly socially defined.

Dunn²⁹ classifies medical systems into local, regional, and cosmopolitan. Local and regional medical systems accommodate indigenous and traditional methods of healing, and are normally intracultural, although not insulated from exchange with other systems. In the local medical system is included folk medicine which includes midwives, bone-setters, supernatural curers of various types, and other folk healers. The concepts and practices in folk medicine draw upon the humoral theory, cosmological speculations and magical practices.³⁰ Regional medical systems include the Ayurveda, Unani [or even Chinese]. Leslie³¹ divided this category into classic and professionalised; the former based on the classic Sanskrit texts, Caraka and Susruta Samhitas, in the Ayurveda and on the classic Arabic texts in Unani. 'Professionalised' Ayurveda and Unani medicine, on the other hand, have continued the 'syncretism' of the past - transforming learned traditional cultural medicine by assimilating western medical knowledge and institutions. Cosmopolitan medical system is the

institutionalised system of the West. The three types of medical systems may differ in theory and practice but share a common feature which is beyond the fringe of science - that is, the reliance on tacit communication between practitioners and clients. For our discussion, I have taken the Ayurveda and Unani systems as regional medical systems, attempting to 'professionalise' in the light of western medicine, but meeting with only partial success in establishing institutions.

Rationale for the Study

A study of the history of medicine may provide insights into the factors influencing a particular system of medicine. It can help us to judge a] the strengths and weaknesses in the system of medicine, and b] how that system might be improved. A clear understanding of the former requires a distinction between science and magical or religious practices. If we judge Indian medicine by its

"use of naturalistic theories to interpret empirical observations",³²

then it is scientific. But if science is seen to involve precision and measurement aided by instruments or technology, then the system may be less scientific. In the case of Indian medicine in British rule, lack of development of technology became apparent after the introduction of western medicine, although even in the

West, discoveries and innovations were regrouped only retrospectively in order to bring them into proper usage. As Sigerist claims, history of medicine is both "history and medicine"; as the former, it includes a chronological order of the existence of medical authorities and of medical practice; and as the latter, it represents the gradual transition of ideas and medical concepts, discoveries etc., from one period to the other.³³

Merton identified science as a social institution with a characteristic ethos and subjected it to functional analysis. The ethos of science, he argued, is a complex of values and norms which is held to be binding on the man of science.³⁴ Merton's theory throws light on the functional aspect of science in the wider society. Barnes' discussion, alternatively, illustrates the development of science with respect to the social reorganisation of industrial societies;

"the provision of fully differentiated scientific roles as careers, and of prolonged full-time training for them, their isolation and concentration into laboratories, and their formal division into disciplines and specialities, were all nineteenth-century innovations, which reflected the general trends towards professionalisation and specialisation, characteristic of industrial society as a whole".³⁵

The development of medicine in the West, then, seems to fit into Barnes' concept of science.

Medicine, like other fields and disciplines, has been changing over a period of time, incorporating innovations and novel experimental methods and the like. It is true that Indian medicine in ancient India, prior to the sixth century B.C., was apparently related with religion, attributing diseases and their cure to the supernatural. This brings us back to the above distinction between science and religion. The practices which were associated with religion seem to have had more mundane and empirical origins. The knowledge of medicine now called the Ayurveda, thus, existed long before the codification. Jolly remarked on the antiquity of ancient Indian medicine which, he claimed,

"can be regarded as the oldest of Indian sciences and has been proved to be the science in which the Indians specialized first".³⁶

Sources

While preparing this thesis, I found that historical and sociological evidence regarding State patronage to Indian medicine is rarely found in clear-cut terms and that I had to deduce a great deal circumstantially.

The thesis is based on records - published and unpublished - relating to period under study, 1800 to 1947. These include Parliamentary Papers, Medical Proceedings, Despatches [Bengal

and India], Bengal Government Reports on Administration, Medical Gazette, Medical Journals, Census, and writings on the history of medicine. I hope, through the study, to increase the understanding of the career of Indian medicine in Bengal during British India. Insofar as I have been able to take stock of the degree of veracity of many of the popular governing assumptions relating to this area, then a fresh study on the dynamics of Indian medicine in contemporary India can be legitimately launched.

The scanty sources available in the libraries of Calcutta posed problems. Unfortunately, some of the records of the nineteenth and early twentieth centuries were destroyed by fire. In addition, there was no easy access to those available, especially in the Bengal State Archives and the Secretariat Library. Informative accounts of the Native Medical Institution for 1823 and 1832 which were amongst the few remaining records, were too "fragile to handle", and hence not obtainable. Nevertheless, I did manage to get maximum information with the support of the Director of the National Library in Calcutta.

The material for this work is drawn from the sources available in the following libraries:

In Edinburgh,

- a. Edinburgh University Library
- b. Erskine Medical Library
- c. Scottish Records Office

In London,

- a. Indian Office Library
- b. British Museum Library
- c. School of Oriental and African Studies

In Calcutta,

- a. National Library
- b. Bengal State Archives
- c. Bengal Secretariat Library
- d. Asiatic Society Library

In Delhi,

- a. National Archives of India
- b. Central Council for Research in Ayurveda and Unani
- c. Nehru Memorial Library
- d. Jawaharlal Nehru University Library
- e. Delhi University Library
- f. History of Medicine Department at the All India
Institute of Medical Sciences.

My stay in India lasted about 10 months of which 8 months were spent using the above libraries in Calcutta - from October 1984 to May 1985. In developing this work, however, I was restricted by the availability of sources as well as the time-limit for the completion of the tenure of my study.

F O O T N O T E S, Chapter I

1. J.C. Hume, Medicine in the Punjab, 1849-1911: Ethnicity and Professionalisation in the Control of an Occupation, 1977, Ph.D. Thesis, Duke University.
2. A.R. Desai, Social Background of Indian Nationalism, Bombay, Popular Prakashan.
3. Ibid.
4. D.R. Gadgil, Industrial Evolution in Indian in Recent Times, 1860-1939, 1971, Delhi, Oxford University Press - Book Review by Ume Jan Woltemade, J.As.Stud., 1973-74, Vol.33, no.1, pp.143-144.
5. This figures as an important feature of most of the revivalist movements in South Asian history. See Paul Brass, "The Politics of Ayurvedic Education: A Case Study of Revivalism and Modernization in India" in S.H. Rudolph and L.J. Rudolph (eds.), Education and Politics in India, 1972, Oxford University Press, p.344.
6. B. Chandra, A. Tripathi and Barun De, Freedom Struggle, 1972, Delhi, National Book Trust, p.39.
7. Ralph Crozier, "Medicine and Modernization in China", Comp.Stud. Soc. and His., 1970, Vol.12, pp.275-291.
8. A similar pattern of movement is to be found in China where the people made vociferous demands in favour of traditional medicine. See also Crozier, *ibid.*
9. D. Kumar, Land and Caste in South India, 1965, Cambridge, Cambridge University Press. See also B. Warren, Imperialism: Pioneer of Capitalism, 1980, London, Veaso.
10. Ibid.
11. N. Charlesworth, British Rule and the Indian Economy, 1800-1914, 1982, London, Macmillan Press.
12. R. Dutt, The Economic History of Indian in the Victorian Age from the Accession of Queen Victoria in 1837 to the Commencement of the Twentieth Century, 1956, 8th impression, cited by Charlesworth, *ibid.*
13. W. Digby, Prosperous British India, 1901, cited by Charlesworth, *op.cit.*
14. P. Griffiths, The British Impact on India, 1952, cited by Charlesworth, *op.cit.*

15. S. Avineri, Karl Marx on Colonialism and Modernisation, 1969, New York, p.190.
16. N.H. Keswani, "Medical Heritage of India" in N.H. Keswani (ed.), The Science of Medicine and Physiological Concepts in Ancient and Medieval India, 1974, New Delhi, S.K. Manchanda, pp.3-49; p.25.
17. R.C. Majumdar, "Medicine" in D.M. Bose (ed.), A Concise History of Science in India, 1971, New Delhi, Indian National Science Academy, p.266.
18. Majumdar, op.cit.
19. D. Banerji, "Place of the Indigenous and Western Systems of Medicine in the Health Services of India", Int.J.Hlth.Services, 1979, Vol.9, no.3, pp.511-519; p.515.
20. B. Gupta, "Indigenous Medicine in Nineteenth and Twentieth Century Bengal" in C. Leslie (ed.), Asian Medical Systems: A Comparative Study, 1976, London, University of California Press, pp.368-378; p.369.
21. Anonymous. "Hindu medicine and Medical Education", Cal.Rev., 1865, Vol.38, no.LXXXIII, pp.106-125; p.115.
22. D. Arnold, "Medical Priorities and Practice in Nineteenth-Century British India", S.As.Res., 1985, Vol.5, no.2, pp.167-186.
23. Ibid., p.
24. D.P.Chattopadhyaya, Science and Society in Ancient India, 1977, Calcutta, Jayatri Ghosh.
25. Ibid., p.425.
26. See F.L. Dunn, "Traditional Asian Medicine and Cosmopolitan Medicine as Adaptive Systems" in C. Leslie (ed.), op.cit., pp.133-158, p.133.
27. R.N. Wilson, The Sociology of Health: An Introduction, 1970, New York, Random House, p.12. See also Dunn, ibid.
28. T. Parsons, The Social System, 1952, London, Routledge and Kegan Paul, p.431.
29. Dunn, op.cit., pp.135-137.
30. Ibid.

31. C. Leslie, "The Ambiguities of Medical Revivalism in Modern India", in C. Leslie (ed.), *ibid.*, pp.356-367.
32. C. Leslie, "Introduction" in C. Leslie (ed.), *ibid.*, pp.1-12; p.7.
33. H. Sigerist, quoted by P.M. Mehta, "History of Indian Medicine" in P.S. Sharma (ed.), Realms of Ayurveda, 1979, New Delhi, Arnold Heineman, pp.47-85; p.52.
34. R.K. Merton, cited by B. Barnes "Introduction" in B. Barnes (ed.), Sociology of Science, 1972, London, Cox and Wyman, pp.9-16, p.10.
See also R.K. Merton "The Institutional Imperatives of Science" in B. Barnes, *ibid.*
35. Barnes, *ibid.*
36. J. Jolly, cited by N.H. Keswani (ed.), *op.cit.*, pp.3-49.

C H A P T E R I I

INDIGENOUS MEDICINE IN ANCIENT AND MEDIEVAL INDIA:

ITS STATE PRIOR TO BRITISH RULE IN INDIA

Indigenous Medicine in Ancient India

Medicine in India dates back to, at least, the third millennium B.C. Archaeological findings at Mohen-jo-daro in Sindh and at Harappa in Punjab, reveal a high level of social sanitation and hygiene and several therapeutic substances for the treatment of ailments like rheumatism, have been unearthed from the two sites.¹

The history of Indian medicine is generally agreed to have had two phases:

- a) the Vedic period (from c.1500 B.C.)
- b) the post-Vedic (from c.600 B.C.)

This classification, however, creates problems because as we shall see, the Ayurveda, the main text in the post-Vedic period, is closely associated with the Vedic literature which means that it is an essential link with the other Vedas.

Both Vedic and post-Vedic periods were marked by the pre-eminence of Brahmans in society. The real issue is to explain how, with a philosophy which discouraged the practical acquisition of knowledge, Brahmans managed to dominate both periods, since the post-Vedic period was characterised by the growth of practical medicine. It seems that, without generating the knowledge, Brahmans came to appropriate and codify it in Vedic as well as post-Vedic times. This led to an apparently rigid and an undeveloping system of medical knowledge in ancient India. The mechanisms by which this occurred will be illuminating when we consider the relationship between Indian and western medicine in the nineteenth century.

A. Vedic period

The chief repositories of ancient Indian culture and medicine are the four Vedas², Rgveda, Samaveda, Yajurveda and Atharvaveda. Evidence of medical interest can be found from as early as the Rgvedic period (c.1500 B.C.). As Sen puts it,

"an account of the Vedic gods, foremost among whom are twin Asvins playing the role of physicians providing remedies, reflects the interest of the Rgveda in medicine".³

Some authors, for example Garrison⁴, believe that medicine, as practised in Vedic times, was entirely theurgic in that the cause of diseases was attributed to a god or the supernatural.

Treatment consisted in finding means of placating the irate deity through established spells and incantations. However, there is another line of thought about Vedic medicine, represented by Sigerist who claims that it had empirical and rational elements in addition. He writes,

"even in the Vedic samhitas, purely religious books, we find a reflection of anatomical, physiological and pathological views which are neither magical nor religious and we hear of treatments which impress us as being rational".⁵

Sigerist's view is supported in the latest of the Vedas - the Atharvaveda which mentions two types of healing:

- a. dealing with reciting magical verses and incantations,
- b. involving application of drugs along with magical formulae.

The Rgveda contains 1,028 hymns or invocations and 10,522 verses addressed to the gods for sacrificial purposes, but some of the physician-gods, such as Rudra, Soma, Varuna, are also eulogized for their medical skill.⁶ Varuna, for instance, is said to possess a hundred medicines for the ailing.⁷

The Rgveda and the Samaveda are very closely related, and formed the

"backbone of India's religious life for over three thousand years and still represent the most important canonic books of Hinduism".⁸

The Samaveda is a compilation of about 1810 verses recited on

various sacrificial occasions. The Yajurveda belongs to first millennium B.C. and is a compilation of prayers, ritual texts and sacrificial formulae, the more typical of which are in prose sentences called the Yajus from which it derives its name. The compilation exists in two forms - the Sukla-yajurveda or White Yajurveda, and the Krsna-yajurveda or Black Yajurveda. The latter contains a collection of sacrificial formulae, in common with the former, but also contains discussions on magic and sacrificial rituals called Yajnas which are examples of another form of Vedic literature, called the Brahmanas. These celebrate the intellectual activity of the sacerdotal caste or Brahmins, and were developed at a time when the power and privilege of the ruling priests was under threat. Kings and nobles were gradually establishing lay authority which undermined the position of the priests and the unity of the social system as reflected in the earlier Vedas. The priests in this period may have lost some of their special power while maintaining their religious and intellectual dominance.

Brahmins, according to the code of Manu - a guide for the proper conduct of Brahmins who were believed to be the descendants of Lord Brahma - were the custodians of all knowledge, the curators, the writers and above all, the interpreters of the Vedas. Indeed, the Brahmins alone had the right to learn the Vedas. Although they were no longer the sole rulers of the country, as the code of Manu claimed, their religious and intellectual dominance was scarcely undermined. Codified medical theory, therefore, was in the hands of the Brahmin priests and scholars.

It would appear that the view of Sigerist is supported by the content of the Vedas. However, the practice of medicine that they contain is static and surrounded by rituals. There is no process of inquiry which would allow new materials and practices to be added to the system of knowledge. Nevertheless, it will become apparent that significant additions were made to practical medicine during the period of Brahmanical dominance. Both in terms of the conservatism of their religious philosophy and their distaste for medical practice, it is difficult to believe that the impetus came from the community of Brahmans. For example, in the code of Manu, there was a lawful prohibition against contact with dead bodies and accordingly, anyone who touched them was to submit to ritual purification. In general, even although Brahmans may have codified and appropriated medical knowledge, they had a strong distaste for medical practice in ancient India.⁹

The Atharvaveda is a collection of 731 hymns, prayers and incantations in 20 books, and was composed around 1200 B.C. The codification of ancient medicine in what came to be called the Ayurveda is believed to have its origins in the Vedas. In particular, it is believed that the Atharvaveda and the Ayurveda have close links. However, there is a controversy over this.

The two principal texts of the Ayurveda compiled by Caraka and Susruta, respectively, disagree about the relationship. According to Susruta, the Ayurveda is an upanga [small appendage] of the Atharvaveda and was originally composed by Brahma before he created the universe. Dasgupta disagrees with this and asserts that there are too many verses in the Ayurveda for it to be a part of the Atharvaveda.¹⁰

The Ayurveda, as we know it, consists of 10,000 verses and the Atharvaveda contains 6,000 verses. Although both Susruta and Caraka claim that the Ayurveda has divine origin, Caraka allows a long period of discovery and compilation. He argues that the new system of medicine did not arise from a single act of creation but reflected a continuity of the science of life since ancient times. It is only with reference to the first systematised form that it can be said to have a beginning¹¹ and that beginning post-dates the Atharvaveda. Most authorities believe that the Ayurveda dates from the sixth century B.C. The fact, however, remains that the association of the Ayurveda with the Atharvaveda is possible because both of them deal with the treatment of diseases and hence attainment of long life, the former principally by incantations and charms and the latter by medicines; but even during the period of the Atharvaveda, there was an elaborate pharmacopoeia treating diseases with drugs.

Although the origin of the Ayurveda is surrounded by supernaturalism and mythology, it is generally accepted¹² that

"it reveals an awareness of scientific thinking and attitude of the early Indians towards life and health".¹³

It reflects a transition in therapeutics from association with religion and magic to a more rational¹⁴ and scientific¹⁵ method of treatment.

The Ayurveda, as we know it, is presented as a complete text as were the earlier Vedas. But the practice of medicine it contains is of a different nature and order. As a codification, it belongs to the Brahmins but it is difficult to believe that they contributed significantly to its practical substance. Indeed, in the early post-Vedic period, as we shall see, Brahmins acted to stigmatise the growing medical knowledge and practice. Only later, perhaps, reflecting their lack of success in suppressing medical knowledge, did they codify and appropriate the developed practices. In doing so, they attempted to give them a religious origin and a conservative form.

The scientific nature of the Ayurveda may be judged from the extensive knowledge of medicine contained in the chief medical texts of ancient India. These are the Caraka-samhita, the Susruta-samhita and the Astanga-samgraha, collectively called the Vrddha-trayi¹⁶, or the three 'elder ones'. Of these, the

Caraka-samhita gives a detailed classification and nomenclature of diseases - their aetiology, diagnosis and treatment. The Susruta-samhita is a detailed compendium on surgery while the Astanga-samgraha is in the form of a medical manual, the material for which is mainly drawn from the other two samhitas [or compilations]. However, the Caraka and Susruta samhitas remain supremely important for understanding the development of medical theories and practice followed by Ayurvedic practitioners in ancient times. These are based on the following three principles -

1. that every disease has a cause.
2. that the causes are natural rather than supernatural and
3. that there are means and ways of alleviating the incurable diseases - besides treating the curable ones.

The materia medica of the Ayurveda represents a full utilization of environmental resources. The Caraka-samhita lists more than six hundred drugs for the cure of various ailments besides detailing a large number of pathological conditions. The Susruta-samhita, on the other hand, gives primary importance to surgery in medical science.

The science of the Ayurveda, as it figures in the two texts, is divided into eight branches -

a) General medicine

b) Paediatrics

c) Surgery

d) Toxicology

e) Mental diseases

f) Virilifics

g) Tonics and Drugs - rejuvenation

h) Treatment of the Diseases of the Eye, Ear, Throat, Nose and Tongue.

It is also divided into two sections - one focusing on the promotion of health and the other centering on the treatment of diseases which classified all food materials and drugs according to their physical and chemical properties, taste, and ultimate action.

Both the Caraka and Susruta Samhitas view man or purusa as a part of nature, made up of the same stuff or matter that goes into the making of everything else in nature. That is, man is a microcosm of the universe both of which are comprised of the same matter or rasa which the pioneers of science conceived as existing in five forms or bhutas, namely earth, water, fire, air and sky. The theory, referred^{to} as the Pancabhuta theory, occupied a central place in the practice of ancient medicine.¹⁷

The ancient physicians argued that matter gets transformed into an infinite variety of inanimate and animate things in the universe by the laws inherent in nature of svabhava - the laws because of which fire, for example, is hot and water cold.¹⁸ Also, human life depends not only on these five elements or bhutas but also on

the normal functioning of the body humours, the mind and the soul; the latter two constitute the psychosomatic aspect of the Ayurveda. The three humours, or doshas as they are commonly called, recognized by Ayurvedic physicians are Vata, Pitha and Kapha, corresponding to air, bile and phlegm, respectively. These form the basis of all theories and practice, and diagnosis of the Ayurveda. The Ayurvedic physicians observed a fundamental unity of man and nature. Since man and nature were made up of the same elements, nothing in nature was considered irrelevant for medical purposes.

The Caraka-samhita is composed of verses alternating with mnemonic verses,¹⁹ and about 120 chapters which exist in eight forms or books:

- a) Sutra-sthana, which discusses in 30 chapters the history, general principles, theoretical basis, etc. of medicine;
- b) Nidana-sthana, which discusses in 8 chapters the causes of various diseases and their symptoms;
- c) Vimana-sthana, which includes 8 chapters on the nature and qualities of matter, the methodology of medical science, and codes of conduct of medical practitioners;
- d) Sarira-sthana, which includes a discussion in 8 chapters on anatomy and embryology;
- e) Indriya-sthana, which has 12 chapters on diagnosis and prognosis of diseases;

- f) Cikitsa- sthana, discussing mainly therapeutics; also dietetics and pharmacology in 36 chapters. This was an important book on the healing techniques in Ayurveda;
- g) Kalpa-sthana, containing 12 chapters on the pharmacopoeia of Indian medicine;
- h) Siddhi-sthana, discussing in 12 chapters enema, purgatives and urinary diseases.

Illness was seen as a result of the derangement in or predominance of any of these humours. Besides, diagnosis also involved bhumi-pariksa or "examination of the place" for an adequate understanding of the patient's ailing condition.²⁰ By 'place' is meant the social conditions such as food-habits, mode of living, and other customs and general conditions of health influencing the patient. Susruta also emphasizes the importance of direct sense-perception for diagnostic purposes which, according to Susruta-samhita, was more accurately corroborated by direct observation of human anatomy which rendered it necessary in medical science to dissect the corpse.

Therapeutics in the Ayurveda followed from a knowledge of the interaction between environmental matter and body matter, as conditions of health and disease were said to depend on the environmental matter. Treatment then consisted in readjusting or neutralising the morbid humours resulting from the wrong absorption of environmental matter. Caraka lists two types of substances in

this respect; those increasing the body elements are called samanya while those decreasing them are referred to as visesa. The principle of samanya and visesa was the main support of the Ayurveda on which was based the application of medicines and the course of diet, drugs and physiotherapeutic measures.²¹

There are two aspects of therapeutics in the Ayurveda on the basis of which it may be held to be scientific - the Curative and the Preventive. The former involves internal administration or external application of medicines, and the latter involves personal and social hygiene, use of rejuvenating measures to prevent ageing and decay [through herbal drugs as well as exercises], and lastly, practice of yoga for tranquility of mind and physical relaxation.

The following verse quoted from the Caraka-samhita²² indicates the therapeutic nature of the Cikitsa-sthana:

"iti sarva-vikaranam uktam etad cikitsitam
sthanam etat hi tantrasya rahasyam param uttamam"
Or, "thus this is said to be the cure for bodily
and mental disturbances and is assuredly the basis
of medical doctrine or the supreme, highest secret".

The basic difference between the Caraka and Susruta samhitas, thus, stems from the different branches of medical science on which the two compilations focus. Susruta samhita, like its contemporary text, is divided into five books comprised of 120 chapters:

- a. Sutra- sthana, with 46 chapters on construction of surgical appliances, practice of surgery;
- b. Nidana-sthana, with 16 chapters on the causes of diseases;
- c. Sarira-sthana, with 10 chapters on anatomy, embryology and the technique of dissection;
- d. Cikitsa- sthana, discussing in 40 chapters the therapeutic techniques followed by Ayurvedic physicians;
- e. Kalpa-sthana, discussing toxicology in 8 chapters.

The beginning of instruction or training of physicians, as evident from Caraka and Susruta samhitas, was preceded by a consecration ceremony, or upanayana. The study consisted of memorising verses or sutras serially, followed by discussions and conversations with the teacher. Susruta also stresses the importance of practical training as well as methodical instructions in surgical operations.²³ According to him, the pupil should learn

"to open blood-vessels of dead animals, to probe on the openings of a worm-eaten wood, bamboo etc., to bandage limbs of a doll made of stuff or other material, and to practise cauterization and branding on tender flesh etc."²⁴

The next step after the completion of medical training was the rational application of natural substances which was called Yukti.

It was not the mere knowledge of substances but the intellectual discipline or Yukti that was considered to be the ultimate foundation of therapeutic success in the Ayurveda.²⁵

Caraka²⁶ held a physician accomplished in rational application to be superior to one with the mere knowledge of the substance, or siddih yuktan pratisthita / tisthati upari yuktijnah dravyajnanavatam sada. Lastly, the medical knowledge acquired by the physician was expanded by intra- disciplinary debates and discussions. Caraka recorded the whole set of technical terms relating to such disputes.²⁷ This was an important feature of the theoretical plank of the Ayurveda in ancient India.

Surgery in ancient India also had reached an advanced state of development. In the absence of authentic records, it is difficult to account satisfactorily for the disuse into which dissection had fallen. However, it may be assumed that prohibition of contact with dead bodies for purposes of anatomical and physiological knowledge hampered development in these two fields of medical science. And yet, the art of bone-setting had reached a high degree of skill. Added to this was the science of rhinoplasty [surgery of the nose] in which the physicians of ancient India excelled. Indian surgery, in this respect, may be said to have been ahead of that of the West at that time.²⁸

Besides India, the practice of dissection was not favoured by other ancient medical traditions, such as that of Greece where again it was relegated to barber-surgeons. In ancient Greece, as in other ancient civilizations, disease was believed to be inflicted by God; man's fate was said to be under the control of the supernatural. A comparison of Indian with Greek medicine demonstrates the factors influencing the development of the two medical systems.

While Greek physicians, on the one hand, accorded more importance to theory in medical science, Indian physicians, on the other, believed in the practice of medical science, the reason for ignoring manual work in practice being the general contempt for it by the new ruling class that emerged in Greece around the fifth century B.C. And for Farrington, "the head was independent of the hands".²⁹ In other words, theory bore no relation to practice for the leisured class. The job of collecting herbs for therapeutic purposes was relegated to manual workers or herb collectors ranking low in the hierarchical society. As a result, the physicians, it is said, failed to acquire substantial knowledge of the use of drugs. They were what Childe called 'theoretical researchers', transforming medicine from a positive science into a speculative philosophy.³⁰ Even the famous Greek medical text, Hippocratic Corpus, makes no specific mention of the pharmacopoeia. The medical matter in the corpus is appallingly thin in therapeutic content. The situation was somewhat different in India where we find an elaborate description of the application and collection of drugs in the

ancient medical texts. The Indian physician, unlike that of Greece, was expected to have a sound knowledge of herbs and what was despised by the law-givers was the application of these for therapeutic purposes.

In Greece, thus, the doctors were deprived not only of the knowledge of the drugs proper but also of the "opportunity of enriching their general outlook on various other drugs".³¹ When we compare this with the knowledge as preserved in the Ayurvedic texts, we find that the special emphasis on the work of herb-collection by the physician enabled him to improve and enrich the theoretical basis of the Ayurveda. This is missed by the Hippocratic writers of Greece. From this, we may conclude that the theoretical knowledge of Indian physicians was ahead of that of Greek physicians. The Ayurveda also differs from Greek medicine in the extent to which the physicians attained practical success. The Caraka samhita, for instance, emphasizes that

"it is the practical success which makes one a first rate physician endowed with all the required medical qualification".³²

On the contrary, Greek physicians were in no position to prescribe effective treatment and relied on the curative power of Nature.

With this vastly different nature of medical knowledge in the Ayurveda and Greek medicine, it is hard to believe that Indian medicine was influenced by Greek medicine. However, there are two lines of thought on this. Kutumbiah³³, for instance, argues that the Ayurveda was the predecessor of its Greek counterpart and that,

"the science of medicine flourished in India long before it did in Greece".³⁴

According to Jolly³⁵ and Filliozat,³⁶ on the other hand, the two systems of medicine developed independently without one influencing the other. For Filliozat, a leading French Sanskritist, the diffusion and spread of Indian medicine to neighbouring countries and South-East Asia, with the spread of Buddhism, is comparable to the spread of Greek medicine throughout the West and the Eastern world too.

The issue of influence still remains controversial. Nevertheless, our argument may support Kutumbiah for the reasons we have given in support of the advancement of medical knowledge contained in the Ayurvedic texts.

The philosophy of practice in the Ayurveda did not go with the religious philosophy of ancient India. Thus the Ayurvedic physicians, as a result of the new methodology, were closer to the materialist school of philosophy. This was called the Lokayata

school,³⁷ attributed to Carvaka as its founder. Followers of this school, or Lokayatas, were basically opposed to the Vedas. They denied the concept of reincarnation³⁸ and the existence of the soul, and believed in the formation of the body as a result of the combination of elements called earth, water, air and fire.³⁹ Since materialism was not favoured by Brahmanism,⁴⁰ the school did not develop further. The philosophical basis of the school and of the Ayurveda may have been the same with respect to the view of the unity of man and nature. But in the Ayurveda, there was a lot more than this. The observation of facts [natural phenomena] and the rational processing of empirical data⁴¹ constituted an important principle of Indian medicine. The Ayurvedic physicians were able to prescribe effective palliatives even for diseases that they thought were incurable. This openly flouted the law of Karma according to which an incurable disease is the result of bad deeds of a previous birth and, surely, must have opposed the law-givers for whom Karma justified the magico-religious therapeutics.⁴²

As a result of the new methodology of science, the physicians came under strong condemnation. "Medicine was regarded as too derogatory a profession to be followed by any member of a privileged class" and was finally entrusted on the base-born offsprings of Aryans; the latter, according to the law-codes of Baudhyana,⁴³ were called Ambasthas.⁴⁴ In Bengal, the origin of the Ambasthas has remained controversial. According to Risley,⁴⁵

the term is synonymous with Vaidya or Baidya. There is no mention of the name either Vaidya or Baidya in the code of Manu. The Ambasthas are, however, said to be the offsprings of Aryans born in violation of mating laws - Brahmin male with a Vaisya female. The Vaidyas [or Vaids] of Bengal, thus come to be the Ambasthas of Manu⁴⁶ to whom was delegated the practice of medicine in ancient India. (Appendix I).

The later Vedic literature represented by the Yajurveda and the Brahmanas, for the first time gives evidence of the hostility of priests to ancient physicians.⁴⁷ Of the two versions of Yajurveda called the White [Sukla] and Black [Krisna], the latter gives a detailed account of the denunciation of physicians at the time. Taittiriya-samhita, a recension of Black Yajurveda, clearly expresses the attitude of priests to doctors. Besides, the Satpatha Brahmana also mentions the degradation of twin-physicians for their association with common people. The other recensions of Black Yajurveda, namely, Maitrayani-samhita, Kathaka-samhita, and Kapisthala-samhita, suggest similar reasons for regarding Asvins as impure; firstly, because they were doctors, and secondly, because the medical profession called for mingling with other people in the society.⁴⁸

The physicians' rejection of scriptural declarations went against the orthodoxy of the time and

"the emphasis of the supreme importance of knowledge based on direct observation of facts was enough to annoy the spokesmen of orthodoxy, because it left hardly any scope for their advocacy for the implicit faith in scriptures".⁴⁹

Also, the belief in the action of the drug being determined by the substance [drug] itself instead of the supernatural was not favoured by the ruling authorities. This formed the basis of the priestly reaction towards the Ayurveda in ancient times. They were making sure that the physicians, by virtue of their profession and by questioning the scriptural declarations, did not claim a superior position in the social hierarchy. To this effect, the beliefs on pollution and purity were activated which, in turn, pushed status-seeking physicians away from conducting renewed investigations in the field.

Although the Ayurveda was claimed by the Brahmins to have had a divine origin, there are indications of the opposition of the Brahmins to the practice it contained in ancient India. This opposition arose from the fact that the physicians were actually following the practical knowledge of the Ayurveda which flouted the religious ideology.

Disregard for these physicians was, indeed, continued through legal contempt. The first evidence of this dates back to the sixth-century B.C.,⁵⁰ as is also mentioned in the law-codes of the

earliest group of Indian law-givers represented by Apastamba, Gautama and Vasistha. In fact, the entire legal literature from the Christian era right up to the period of Manu, reveals an intense contempt for medical practitioners. And the usual way of expressing this hostility was to declare doctors as intrinsically impure,

"so impure indeed that their very presence pollutes a place, that food offered by them is too filthy to be accepted and that even the food offered to them turns into something vile".⁵¹

Gautama's law-codes indicated that a Brahman may not accept food from an artisan, a criminal, a surgeon and such other persons. In the Dharmasutras, which were later developed into smritis,⁵² oldest among which was that of Manu, the presence of physicians and all craftsmen in general was said to destroy the sanctity of a sacrifice for which reason surgeons were not allowed at sacrificial ceremonies. Chattopadhyaya does not regard Dharmasutras as law-literature because these, he says, try to validate and preserve the hierarchical society by emphasizing the religious duties of man rather than legal aspects. And for Winternitz, these were written by Brahmans and priests for the purpose of imparting religious instructions, and were not written as codes for practical use in the codes of law.⁵³

While on the one hand, the religious orthodoxy disfavoured the practice of medicine by the physicians, the rise of indigenous faiths in ancient India on the other, counteracted this assault.

Brahmanism, by the sixth-century B.C., had gained considerable hold over Indian society. Interestingly enough, the period also witnessed the emergence and rise of two other religions of India - Buddhism and Jainism. The former became popular in rural areas and gained more support by appealing to the oppressed castes or the Shudras.⁵⁴ The gradual spread of Buddhism, however, was a challenge to the Brahmanical ideology as the Buddhists questioned the authority of the Vedas and challenged the validity of the law-givers. All this was unwelcome to the Brahmanical custodians of Indian culture.⁵⁵ They never accepted the growth of Buddhist faith, although at a later date, its founder, Buddha was counted as one of the Avataras.⁵⁶

Of all the occupations during the time of Buddha, the medical profession appears to have been valued the most by Buddhists. This is evident from the frequent appreciative mention of a physician called Jivaka during the period.⁵⁷ Buddha's interest in medicine is also reflected in the various texts comprising the Vinaya-pitaka, a collection of rules for the Buddhist order. One of these, called the Mahavagga, describing various therapeutic measures, provides an important guide to the history of medicine. The text omits the law of Karma as playing any role in effective treatment of diseases, and instead, says that medical care and success depend on the doctor, the nurse, the medicine and the patient himself. As a reaction to this, Taxila, a famous Buddhist centre for the cultivation of medical science was declared impure by

By this time, the Monastic system of training had come into existence. This involved training in monasteries established by Buddha and his disciples, which reflected the transition in the methodology of medical science from magico-religious to rational therapeutics.⁵⁹ For it entailed instructions through practical demonstrations. Medical training constituted a *sine qua non* of the medical profession. Also, it involved training students for seven years for medical and surgical operations. Jivaka, for instance, is said to have worked his way up to become the royal physician of Magadha through such a period of successful treatments.⁶⁰

The Monastic system was opposed by the Brahmanic system of training. This involved ^{the} consecration ceremony [upanayana], followed by memorization of the religious scriptures. And since the Brahmans appropriated all knowledge - medical as well as religious - medical instructions, which were mainly theoretical, were imparted as a part of the entire gamut of religious training. Homes of the priests served as centres of education.

The hostility between Brahmanism and Buddhism continued until about the first or second-century B.C. when the advocates of the two faiths came to a rapprochement. We do not know the reasons for this. Nevertheless, the available evidence shows that this was possible primarily because the kings and nobles patronised both religions with equal enthusiasm.

Thus, it was about this time that King Asoka, of the Mauryan Empire, built temples of Siva [Hindu God] as well as monasteries for Buddhist monks. The two religions are known to have flourished well during the reign of Asoka and even claimed the same persons as their devotees.⁶¹ Asoka's reign is also significant from the point of view of medical history. He established hospitals all over India⁶² where physicians may have worked and cared for the native sick. All branches of the Ayurveda had spread to foreign lands through Buddhist monks, perhaps facilitated by the establishment of monasteries for the latter.

It is believed that about the beginning of the Christian era, the Ayurveda had reached its apogee, spreading to neighbouring countries and also influencing other systems of medicine in Egypt, Greece, Rome and Arabia. The spread of the Ayurveda was also influenced by the Buddhist missionaries with whom went the reputation of the Ayurveda, as also Indian culture, beyond the bounds of India. Its popularity was evident from the large influx of students who came from these countries to learn Indian sciences and arts. The Ayurvedic system of medicine existed in a different form in South India, and was called Siddha; this is a Tamil-language variant of the Ayurveda. However, in the discussion to follow, I shall focus on the state of medicine in North India which is particularly relevant to my concerns.

Nothing is known about the state of medicine during the reign of the succeeding rulers - the Sungas and Sakas. Following them, the Kushans spent lavishly on the erection of stupas and images of Buddha in different parts of the country. The last ruler of Kushan dynasty, Kanishka, embraced Hinduism [Brahmanism] and patronised Nagarjuna - the famous Indian alchemist. Another physician called Caraka existed at the royal court. The age of Kushanas had, in fact, been a period of great missionary and literary activities. Inclusion of metals in the Ayurvedic pharmacopoeia⁶³ marked a significant achievement of medical men during Kanishka's rule. It is now evident that Ayurvedic physicians were patronised by the royal courts.

The Gupta emperors, it is stated, also patronised Brahmanism; nevertheless, they showed a marked tolerance towards Buddhism. The period was thus marked by the growth of various Brahmanical cults, like that of Bhagvatas and Saivas [related to Lord Siva], along with the increase in the number of monasteries. The fact of common patronage gradually brought the two faiths very close. For medicine, the rulers' interest found expression in the increasing number of medical compendia produced at that time. The physicians, at the behest of the ruling emperors, were pre-occupied with writing commentaries on medical science and with adding on medical contents to the extant compilations. This is when Caraka and Susruta-samhitas, the principal texts of the Ayurveda, become available in a codified form. The compilations increased in number but the

compilers limited themselves to collecting facts without any systematic description of medical elements.⁶⁴ Vagbhata, a physician of fifth- or sixth-century A.D. summarized Caraka's work into eight chapters which later came to be known as Astanga-samgraha or Astanga- Ayurveda. Another physician called Dhanvantari existed at the court of King Vikramaditya.

We know that the influence of the priests and Brahmans in ancient India was based on the religious appropriation of intellectual activity. To this end, they appropriated all forms of knowledge, attempting to give them a religious basis. And since of all the disciplines in ancient India, medicine was committed to aspire for a practical knowledge of nature and man, it became the first 'casualty',⁶⁵ of priestly reaction. Thus even at the time when the Ayurveda was redacted - that is, during the Gupta period - the Brahmans were attacking the physicians for their practice of medical knowledge. It is, therefore, plausible that the Ayurveda as a religious text came much later than the practices it contained, and was, perhaps, codified during the rule of the Guptas in India. Following this, several medical compilations with religious superimpositions were written and redacted in later years.

The important task of compilation, thus, continued unabated in the post-Gupta period. These texts display a Brahmanical bias. This meant that the theoretical basis of medical knowledge continued to build up in size without any room for medical practice. Thus

"to add apparent conviction to its loyalty to the norm of orthodox piety, special chapters were added to the text", as in the extant Caraka-samhita, for "loudly proclaiming the theory of soul and its salvation".⁶⁶

A number of texts were then re-written with an underlining of Brahmanical viewpoint which reflects the pre-eminence and continued dominance of Brahmans in the society. (Appendix II).

Indian Medicine in Medieval India

At the end of the ancient period, the Ayurveda represented a codified body of medical knowledge and theory, redacted and edited by various physicians with the addition of useful drugs under the aegis of the ruling authorities at the time.

With the Muhammadan conquest of India in the medieval period came the Greco-Arab or the Unani system of medicine, based on the significant medical concepts of Egypt and Grece and developed in Arabia and Persia under the aegis of the Khalifas of Baghddad. The Arabs enriched it by what was best in the contemporary systems of medicine in Persia, India, China and other regions of Central and Southern Asia. The system was later organized on sound lines by the Mughals in medieval India.⁶⁷

It will be evident from the following account that there were three factors common to the Ayurveda and Unani systems of medicine in medieval India, which facilitated their friendly coexistence. These were the emphasis on compilation work, the importance of humoral theory and the method of dissemination of medical knowledge.

The medieval Indian kings, we are told by Siddiqui⁶⁸ and Israili⁶⁹, took active interest in encouraging their physicians to contribute to medical knowledge by producing medical literature. They provided facilities and set up clinics for these physicians. [A list of important works produced during the period is shown in Appendix III].

Among the various books on Unani medicine is the well-known Madanu-Shifa Sikarshahi which contains commentaries on Unani; also, it incorporates many useful medicinal herbs utilised by Ayurvedic and Unani physicians.

It appears that medical practitioners of the time had made it a practice to gather their life-long experience in book form to present as gifts to the reigning personages. Some of them did this in a competitive manner to surpass others - the grander the compilation the more enviable the position of the author. The compendia were nothing more than a collection of ways of treatment -

the effects and qualities of herbs used for various disease conditions and the results of application of these to patients. The period was then marked by a proliferation of the compendia, perhaps mistaken for new scientific achievements. As a matter of fact, both classes of physicians attained fame and wealth at the royal courts. At this stage, no real advance characterised the field of medicine, the only achievement being translation of most of the medical treatises into Persian, as Persian happened to be the court language in medieval India. This activity was not confined to Unani physicians, or Hakeems alone. Ancient Indian physicians, or Vaids, too, were engaged in compilation work. Original texts on ancient medicine were redacted by them, with the addition of therapeutic agents on the basis of their experience in the field.

Thus, engagement of physicians in adding to medical compendia was one factor favouring the co-existence of the Ayurveda and Unani.

The theory of body humours was of pivotal importance in both the Ayurvedic and Unani practices. The only difference between the humoral theory of Ayurveda and Unani, perhaps lay in the number of humours recognized by the two classes of physicians. While Hakeems focused on the tetrahumoral hypothesis, Vaids, on the other, recognised the trihumoral theory for diagnostic and therapeutic purposes.

Physicians of Unani supposed the presence, in the body, of four humours namely, blood, phlegm, yellow-bile and black-bile which made up the body constitution and caused conditions of pain and health. Practitioners of both attempted to correlate the proportion of humours to conditions of health and illness. Accordingly, disturbance or preponderance of any of these determines the cause of the disease, while a healthy body is a result of equilibrium and normal blending of the humours. The drugs utilised by Hakeems were classed according to body temperament - described as sanguine, phlegmatic, choleric and melancholic. This difference did not alter the treatment methods adopted by them and consequently, favoured the co-existence of Ayurveda and Unani.

In the early medieval period, or the early phase of Muslim rule in India, teaching centered on the personality of the teacher as 'guru'. There were no established schools of Unani medicine and each hakeem had a few students to be trained in the field; this created a highly personalised didactic atmosphere, in relations between the teacher and the taught. The clinics or homes of physicians served as centres of education. The practice of medicine then was a family occupation passed on to the pupil who almost invariably was his son.⁷⁰ This seems to have continued for generations as is also evidenced by the existence of families of hakeems whose successors even to this day are engaged in the profession.⁷¹ One such genealogy of hakeems is mentioned in a medical text entitled Imtihaan-ul-alba-le- quafat-il-al-tiba.

In this respect, medical training during the Muslim rule was closely akin to the Brahmanic system of the Vedic period. The close contact between the teacher and his pupil was the basis of this sort of training. Because of this, the Unani system of medicine could easily accommodate the Ayurvedic system, which was also reflected in their shared patronage from the Muslim kings. And yet it differed considerably from the Brahmanic system. Since the Persian physicians came to India to serve the royalty, their aims and aspirations were quite different from those under the orthodoxy in ancient India. Muslim faith did not interfere with the growth of the Unani system of medicine. Medical training through regularised medical institutions thus became pre-eminent.

It was this emphasis on the practical aspect of medicine in Unani which distinguished it from the training of the earlier period. The first such change from traditional 'homes' to schools as centres of medical education was seen during the reign of Firoz Tughlaq.⁷² In the Mughal period, a number of specialists came to the royal courts from Iran and neighbouring countries. Descendants or heirs of many of these practised Unani medicine, in the clinics established by the Mughals (1526-1707), for four to five generations continuously.

The Ayurvedic and Unani systems of medicine then flourished not only because of internal similarities but also because of the patronage their physicians received from the ruling kings. This

helped to retain the nature of medical knowledge in the Ayurveda and Unani medicine. For the task of compiling medical texts continued uninterrupted in the medieval period.

Even in medieval India, the Ayurveda passed through phases of conservation and advancement in terms of medical knowledge. The religious underlining in the Ayurvedic texts of ancient times did not appeal to the early Muslim rulers. As a result, the Muslim royalty recognized hakeems brought from Persia. And it was only in later years that the Brahmins probably gave way in order to incorporate the scientific essentials of a new system of medicine. The conservative nature of ancient medicine at this stage proceeded towards a state of dynamism due to the influence of Unani medicine. Added to this was the rising status of medicine under the Muslim rulers who made constant efforts to systematise medical knowledge of the time.

The reign of Altamish (1296-1321 A.D.) is significant for it involved a large influx of Unani physicians who worked at the royal courts or established private clinics for the sick. Political stability and economic prosperity at that time also attracted more medical men during the period. About 45 physicians are said to have found employment in State establishments [courts and hospitals] during the reign of Alauddin Khilji (1296-1321 A.D.).

The influx of medical men continued in the subsequent period, too. Several medical compendia were written by these physicians. Majmua-i-Ziae, for instance, was compiled by one of the courtiers of Muhammad Tughlaq. The manuscript provides a useful guide to the knowledge and practice of medicine in that period and, more importantly, was based on Arabic and Ayurvedic medical works, thus reflecting the importance of ancient medicine. About 70 hospitals existed in Delhi during the reign of Muhammad Tughlaq, and about 1,200 physicians were in his employment.⁷³

The phase of systematising medical knowledge now involved the Ayurvedic medicine too. Following Muhammed Tughlaq's rule, Firoz Tughlaq encouraged his physicians to contribute to medical literature. He was well conversant with the field and was a good bone-setter too. He founded a large hospital where he normally attended to the patients.⁷⁴ Ali Muhammad, physician to Mahmud Shah, translated a book of Vagbhata on Ayurvedic medicine into Persian. This was called Tibbe Firoz Shahi.⁷⁵ Besides, the king established a department, in Gujarat, for translation of famous Arabic and Sanskrit books into Persian. Tarikh ibn Khallikan and Mishkat Sharif existed as some of the well-known works.

During the reign of Shah Sikander Lodhi, Bahwa bin Khawas, a noted court physician, brought out the Tibbi-Sikandari from the Ayurvedic sources, namely, Susruta and Caraka Samhitas, Ras Ratnagar, Sarang Dhar, Madhawbdan, Cintaman and Chakradat.⁷⁶



Following the Tughlaq rule in 1414 A.D., the Delhi Sultanate passed into the hands of the Sayyids who ruled till 1451 A.D. They gave place to Lodi Afghans about the same time. And after the death of Bahlul Lodi in 1489, Sikander Lodi, having ascended to the throne, employed one Mian Bhowa at his court. Bhowa's main contribution of 1512 was called Madan-ul-Shifa Sikandar Shahi, in which he pointed out

"Unani medicine was not the best suited system for the people of India where the climate and vegetation were different from those prevailing in Greece and Arabia, and that there is a need to have a book prepared in Persian that should contain the best of the Ayurvedic system and its drugs". 77

The Sultan, it seems, agreed to such a project and Bhowa took every opportunity to employ scholarly Hakeems to assist him. In the regular hospitals established by the State which were manned by physicians, jobs were offered to the latter to practise medicine; a few had private clinics for the service of the patients. The medical knowledge in the Ayurveda had, by this time, proved to be significant to the Muslim rulers. In the next phase, thus, it found considerable accommodation in the Unani system when the two systems were integrated.

Hakeem Yusuf bin Muhammad, a physician during Babur's reign, composed medical works integrating the Ayurvedic and Unani systems of medicine. He collected relevant material pertaining to hygiene,

diagnosis and treatment of diseases, from Ayurvedic and Unani sources to highlighting the significant aspects of them. Several skilled physicians and surgeons who had accompanied Babur were associated with his army.

Another important encyclopaedic work on twelve different subjects, inclusive of medicine, and called Pearl of Science, was compiled by one Maulana Muhammad Fazl - a celebrated philosopher-physician at Humayun's court. Following him, Akbar carried on the task of encouraging compilation work. Akbar's reign is important from the point of view of scientific and social and cultural developments. The emphasis on translation was considered indispensable to the development of medical knowledge so much so that Akbar, we believe, established a Bureau for Translation and Compilation. It is true that the real spur to these activities was provided by the interest that the reigning monarch took in them.⁷⁸ An important literary achievement of the period includes Fawa'id al-insan - a treatise including the diet and drugs used in Iran and India and their known effects on treatment cases. The Ayurvedic system of medicine was, then, not discriminated against by the Mughal regime.⁷⁹ Akbar also appointed three Hindu physicians⁸⁰ in addition to Persian ones.⁸¹ Tabaqat-i-Akbari, another medical writing, lists some more Hindus at the royal court. The physicians during Akbar's reign were paid from the treasury, Purshigan.⁸² Thus it was during Akbar's reign that the Ayurveda and Unani received the greatest fillip.

During Jehangir's reign, one Hakeem Ruhallah translated an Ayurvedic treatise on hygiene, along with another work embodying the techniques and practices adopted by the two classes of physicians. Jehangir is known to have been well-versed in medical science for which reason he was able to prescribe medicines successfully.⁸³

It was in later years, following Jehangir's rule, that the healing art, as Jaggi⁸⁴ asserts, had reached its zenith, especially during the reign of Shah Jehan. Shah Jehan equipped the entire country with hospitals throughout its length and breadth. One Masih-uz-Zaman-Hakim Nur-ud-din Muhammad Abdullah, who excelled in surgery, compiled a treatise embodying the achievements of Unani and Indian physicians under the aegis of Akbar, Jehangir and Shah Jehan. Shah Jehan even set up a big hospital in Delhi where treatment was offered free of charge. Of the several who attained fame and prosperity, Amanallah Khan - Jehangir's son - and Hakeem Nur-al-bin-Muhammed excelled their colleagues in the profession.

The relative strength of Indian and Persian physicians mentioned by the chronicles as serving the kings and high nobility under Akbar and Shah Jehan respectively can be gauged from the following table:⁸⁵

	Persian	Indian	Others	Total
1. <u>Under Akbar</u>	14	12	13	39
2. <u>Under Shah Jehan</u>	7	3	1	11

Accordingly, patronage to physicians was steadily shrinking. But we know that all throughout the rule of the Mughals, successful efforts were made in the direction of founding hospitals and clinics where the physicians could cater to the sick population. It may be that instead of employing more men at the courts, the rulers thought it worthwhile to employ them in medical institutions for the benefit of the public at large; in later years, we have seen that special grants were assigned for these institutions as well as for the physicians and other staff.

The reign of the successive ruler, Aurangzeb, is noteworthy for the publication of most of the standard works on Unani medicine. The period was highly propitious for Unani medicine. But even for the Ayurveda, there is no evidence to suggest that Aurangzeb tried to proscribe it as, if he did, it would certainly have been recorded somewhere, and till Aurangzeb's accession, we know, both systems

were patronised conjointly. Aurangzeb established more hospitals in the mofussil or small town and village areas. Nawab Khair Andesh Khan, a famous physician and author, established a hospital where Hakeems worked along with Vaidas and distributed medicines free of cost to the sick.

It is now clear that rulers of each of the local Indian Muslim State had, in their courts, several Hakeems and Vaidas. Special grants, called 'aquaf',⁸⁶ were made by the Mughal emperors, the beneficiaries of which were medical institutions and their staff. The grant was given permanently in trust for the maintenance of madrasas,⁸⁷ besides religious shrines, and for the subsistence of the people working in these institutions. The evidence is availble for Unani institutions, but absence of evidence of equal support to the Ayurveda might also be significant.

Besides, rulers of the Bahmani kingdom of the Deccan, which rose to eminence during the reign of Muhammed Tughlaq as a challenge to his authority, also cared for the health needs of the public, though nothing much in greater detail exists in the records.

The above account highlights the significance of the translation and compilation work as a step towards systematization of medical knowledge in medieval India. And as Siddiqui puts it,

"hakeems of the various parts of India produced a large number of books on various branches of medical science on the basis of Unani or Ayurvedic medical science and on the basis of their experience cases".⁸⁸

Another feature of the dynamic state of medicine at that time involved the rise of literature on Rasa (mercury).⁸⁹ Addition of mercury to the corpus of medical knowledge was an important development in medicine in the early sixteenth century. About the same time, pulse examination for diagnosis of disease made its appearance in the practice of medicine. [Appendix IV].

Two eminent physicians, Hakeem Iskandar Unani and Hakeem Sharif Khan are credited with organizing and spreading Unani medicine on sound lines in India. The former apparently introduced Unani medicine in South India, around the beginning of the nineteenth century; Haider Ali and Tipu Sultan probably encouraged Iskandar Unani to do so because of their personal interest in the field of arts and education. Thereafter, several extant medical books were translated into Persian. South India thus became familiar with the medical works of Greco-Arab physicians. Sharh-i hummiyat-i Qanun and Ilaj al-amrad were the two most distinguished works of Hakeem Sharif Khan. Talif-i-Sharifi was Iskandar Unani's last effort to popularise Unani medicine in India with Hindi equivalents for the local people.⁹⁰ Sharif Khan, on the other hand, was the founder of the family of Unani physicians

called Khandan-i-Sharifi; the last great physician of this family was Hakeem Ajmal Khan who actively followed his predecessors in supporting Unani medicine in India.

In South India, the Deccan appears to be the centre of the flourishing of Unani medicine. This is where most of the compilation and medical work was carried out by a large number of physician-authors. The reigns of Asif Jah and of Sikandar Jah were important for medical activities. Yadgar-i Razai written at this time, represents the most detailed work listing Indian herbs of the Deccan. Dastur-i Am Sikandar Jahi and Mujarribat-i Jamal discuss the Unani principles of diagnosis, with emphases on reading of the pulse and examination of urine, and on the experimental research of the court physicians, respectively. The latter also highlights the ways of treatment and diagnosis in the South during the period of Walajahi.⁹¹

It appears that the Ayurveda and Unani systems of medicine followed the same trajectory, firstly because of the similar nature of their significant essentials and secondly because of the support they received from the Muslim kings. Perhaps the latter arose from the fact that neither the Ayurveda nor Unani posed a threat to each other's existence. It is also known that a large number of Vaidas, besides a few Hakeems, were employed and supported by the middle classes of Mughal India, that is, the mansabdars.⁹² Physicians worked in the contingents of the mansabdars and Shifa-khanas⁹³

established by the State. The services of these physicians were considered important by the State as well as mansabdars in which case it may be assumed that State support in medieval India may not have been an absolutely essential factor for indigenous medical systems to thrive.⁹⁴ Those attached to the contingents of mansabdars were assigned the task of treating the indigent troops. It follows then that their duties were indispensable for the efficient functioning of the imperial-war machine. Sometimes hospitals established by the State in small towns were another agency providing employment to Vaidas and Hakeems. These hospitals existed in small places if these happened to fall within the altamgha⁹⁵ assignments of high nobles and jagirdars.⁹⁶ For Khan,⁹⁷ though the Vaidas working with official agencies - mansabdars, hospitals etc. - outnumbered those at the State level, the services rendered by the two were equally significant.

Thus, two classes of physicians existed in medieval India - one working with the mansabdars and the other serving the kings and nobles; besides these, there were several independent practitioners practising the healing art at village level. Those at the royal courts obtained a respectable income; a majority of these physicians were Persian who were generally more prosperous and enjoyed greater social prestige. Some of them acquired wealth, and through prosperity and fame even rose to the position of nobles; these, however, represented a small fraction of the entire population of physicians.⁹⁸

The halcyon phase of medicine continued in Mughal India until the setting in of political instability and contradictions from seventeenth century onwards. The economic basis of contradictions in Mughal India led to conflicting situations at different levels of Mughal bureaucracy. Also, the restrictions imposed on the jagirdars, the exploitation and maltreatment of the peasant mass⁹⁹ and above all, the zamindar's inability to exact high revenues from the peasants, eventually led to a revolt against the imperial administration.¹⁰⁰ Several stresses and strains followed the trend. The peasants added to the resources of zamindars by engaging in cultivations and even provided recruits for their armed bands. The number of starving, homeless peasants grew, and more and more of them took to arms in revolt against the regime. Such was the combined struggle of the various classes in Mughal India. Despite these contradictions and the hostile attitude of the State, medical practitioners continued to do well under the patronage of the mansabdars.

It might perhaps be reasonable to assume now that the existence of different echelons of physicians - those working with royal courts or with nobles, those working with mansabdars, and lastly, private practitioners practising the profession independent of State - meant that no significant mobility of physicians was actually feasible from the local to the State level; this was probably because of the limited number of physicians employed by the State

and by the mansabdars. From this it follows that medical practitioners and training at the local level were, to a great extent, autonomous of the royal court. In fact, those at local levels may have been trained locally and may have practised in their local communities.

Increasing conflicts in medieval Indian society resulting in several rebellious actions by various social groups finally gave way to the new imperial administration. It was at this stage, I may contend, that indigenous medical systems suffered a setback¹⁰¹ when its patrons - the State and middle classes - were wiped out with the advent of British rule in India.¹⁰² In Bengal, there seems to have been a considerable decline in the urban employment of troops, craftsmen, servants and so on - these were actively supported by the Muslim regime.

The professional practice of Ayurvedic medicine is debatable [details in Chapter IV], but Indian medicine in ancient and medieval periods was in a dynamic process of change in the direction of a 'profession'. Medical training was lengthy. Jivaka, for instance, was trained for seven years at the University of Taxila, and practice was formalised in the form of compilations which indicated its origins in religious orthodoxy sources. Lastly, employment at the royal courts had a significant effect upon the status of medicine. I shall discuss in later chapters how by the nineteenth century, these 'elements' of Indian medicine largely gave rise to 'professional' medicine, though not to the same degree as medicine in Britain.

F O O T N O T E S, Chapter II.

1. H. Sigerist, A History of Medicine, 1961, New York, Oxford University Press, Vol.II.
2. The term 'Veda' means 'knowledge'.
3. S.N. Sen, "A Survey of Source Materials" in D.M. Bose (ed.) A Concise History of Science in India, 1971, New Delhi; Indian National Science Academy, p.16 (hereafter written as Concise History).
4. F.H. Garrison, An Introduction to the History of Medicine, 1913, London, W.B. Saunders.
5. Sigerist, op.cit.
6. B.L. Gordon, Medicine throughout Antiquity, 1949, Philadelphia, F.A. Davis, p.314.
7. D.P. Chattopadhyaya, What is Living and What is Dead in Indian Philosophy, 1976, New Delhi. See also Chattopadhyaya, Science and Society in Ancient India (hereafter written as Science and Society), op.cit., p.236.
8. Sigerist, op.cit., p.151.
9. Chattopadhyaya, op.cit.
10. S.N. Dasgupta, A History of Indian Philosophy, 1952, Cambridge, Cambridge University Press, Vol.II, p.273.
11. Caraka-samhita, 1949 (translated by Shree Gulabkunverba Ayurvedic Society), Jamnagar, Vol.1, no.3.
12. For example Chattopadhyaya, ibid., and J.R. Haldar, Medical Science in Pali Literature, 1977, Calcutta.
13. Ibid.
- 14 & 15. One has to be careful about using these terms. Over here, they would mean observation of medical facts and study of human body prior to diagnosis and treatment of diseases.
16. Chattopadhyaya, Science and Society, op.cit.
17. Chattopadhyaya, Science and Society, p.55.
18. Ibid.

19. The material for the two texts is mainly derived from Chattopadhyaya's Science and Society.
20. Caraka-samhita, Vol.1. See also Chattopadhyaya, Science and Society, p.92.
21. Ibid., p.141.
22. Ibid., p.288.
23. J. Jolly, "Physicians and Therapy" in D.P. Chattopadhyaya (ed.) Studies in the History of Science in India, New Delhi, vol.1, pp.175-208 (hereafter written as Studies in History). See also Chattopadhyaya, Science and Society.
24. Susruta-samhita, P.9. See also Chattopadhyaya, Studies in History, p.176.
25. Chattopadhyaya, Science and Society, p.10.
26. Caraka-samhita, vol.1, pp.120-3.
27. Chattopadhyaya, Science and Society, p.208.
28. A.L.Basham, Wonder That Was India, 1954, London, Sidgwick and Jackson, p.
29. B. Farrington, Head and Hand in Ancient Greece, 1947, London, p.29.
30. Childe, cited by B. Farrington, Head and Hand in Ancient Greece, London, p.30.
31. Chattopadhyaya, Science and Society, p.112.
32. Caraka-samhita, op.cit. See Chattopadhyaya, ibid., p.103.
33. P. Kutumbiah, Ancient Indian Medicine, 1962, Madras, Orient Longmans, p.xi.
34. Ibid.
35. J. Jolly, Indian Medicine,
See also Steinthal, op.cit., p.14.
36. J. Filliozat, The Classical Doctrine of Indian Medicine, 1964, New Delhi, Oriental Publishers, p.v.
37. Other schools orthodox in thought were Vedanta, Nyaya and Vaisesika.

38. That is, identification of the soul and the body and the belief in the destruction of the former as a result of the destruction of human body.
39. For details on Lokayata school, see S.N. Dasgupta, A History of Indian Philosophy, 1952, Cambridge, Cambridge University Press, vol.I.
40. Sigerist, History of Medicine, op.cit.
41. This involved a) careful examination of the patient, b) diagnosis of disease, c) prescribing effective curative drugs.
42. Chattopadhyaya, Science and Society.
43. He was one of the law-givers.
44. Chattopadhyaya, Science and Society, pp.216-18. Ambasthas were the offsprings of Aryans, born in violation of mating laws - a Brahmin male with a Vaishya female.
45. H.H. Risley, The Tribes and Castes of Bengal, 1892, Calcutta, Bengal Secretariat, p.46.
46. Ibid.
47. Chattopadhyaya, Science and Society, p.225.
48. Contact with the masses in any form was detested by the law-givers. See Broomfield in Chattopadhyaya, *ibid.*, p.246.
49. Ibid.
50. Ibid., p.273.
51. Ibid., p.213.
52. Srmitis - refer to the whole body of codes of law handed down memoriter or by tradition.
Sutras - refer to manuals of teaching in ritual, grammar, philosophy, etc.
53. Chattopadhyaya, op.cit., p.223.
54. There have been instances of the lower sections of society converting into Buddhists - also exemplified by Maharashtra (rural areas) claiming over ten million Buddhists who were largely converts from the untouchable or Shudra caste.

54. L. Joshi, Studies in the Buddhistic Culture of India, 1964, Delhi, Motilal Banarsidass, p.398.
56. Avatara means a representative of God. See Joshi, op.cit., p.394.
57. N. Wagle, Society 'at the Time of Buddha, 1966, Bombay, Popular Prakashan, p.140.
58. R. Thapar, A History of India, 1966, vol.I, Penguin, p.37.
59. Chattopadhyaya, ibid.
60. Ibid., p.339-40.
61. N. Dutt, Mahayana Buddhism, 1977, Delhi, Motilal Banarsidass, pp.14-15.
62. J. Mitra, A History of Medicine from pre-Mauryan to Kusana Period, 1974, Varanasi, Jyotirlok Prakasha, p.xiv.
63. K.C. Chakravarti, Ancient Indian Culture and Civilization, 1961, Bombay, Vora, p.273.
64. Filliozat, op.cit., p.1.
65. Chattopadhyaya, Science and Society, p.273.
66. Ibid., p.425.
67. T. Siddiqui, "Unani Medicine in India", Ind.J.His.Sc., 1981, 16 (1) pp.22-25; p.23.
68. Ibid.
69. A.H. Israili, "Education of Unani Medicine during Mughal Period", Stud.His.Med., 1980, 4 (3) pp.177-82; p.180.
70. N.H. Keswani, Medical Education in India since Ancient Times, 1968 (A talk presented at the International Symposium held at California), p.61 (hereafter written as Medical Education).
71. Ibid.
72. Israili, op.cit.
73. M.Z. Siddiqui, "The Unani-Tibb (Greek Medicine) in India" in D.M. Bose (ed.) Concise History, p.272.
74. Keswani, Medical Education, p.62.

75. Ibid.
76. For details see M.A. Al-Wahhab Zahoori, "The Achievements of the Indian Physicians", Stud.His.Med., 3 (1) pp.49-68.
77. O.P. Jaggi, Medicine in Medieval India, 1977, Delhi, Atma Ram, p.114.
78. K. Chandpuri, "Fawa'id Al-Insan", Stud.His.Med., 1 (2) pp.122-28; p.122.
79. P. Bala, "The Ayurvedic System of Medicine - Its Fate in Medieval India", Bull.Ind.Inst.His.Med., XII, 1982, pp.22-27; p.25.
80. Same as Ayurvedic physicians.
81. R.H. Major, A History of Medicine, 1954, Oxford, Blackwell, p.81.
82. Chandpuri, op.cit.
83. R.L. Verma and N.H. Keswani, "Unani Medicine in Medieval India: Its Teachers and Texts" in N.H. Keswani (ed.) The Science of Medicine and Physiological Concepts in Ancient and Medieval India, 1974, New Delhi, S.K. Manchanda, p.137.
84. Jaggi, op.cit., p.181.
85. I.A. Khan, "The Middle Classes in the Mughal Empire", So.Sc., 1976-77, 4 (1), pp.28-49; p.39. To cite a few - Jalaluddin Muzaffar Ardistani Hakim Alimuddin (entitled Wazir Khan) and Hakeem Daud (entitled Taqarrub Khan).
86. I. Habib, The Agrarian System of Mughal India: 1556-1707, 1963, New Delhi, Asia Publishing House, p.
87. These were Muhammadan schools of medical education.
88. M.Z. Siddiqui, op.cit.
89. P. Kutumbiah, "Medicine in Medieval India", Ind.J.His.Med., 1962, VII (1) pp.1-13; p.5.
90. M.A.W. Zahoori, op.cit., p.65.
91. Ibid., pp.65-68.
92. Economy in medieval India was characterised by a feudalistic mode of production in which subordinate or working communities were related to the State through various local intermediaries and local feudal lords. Mansabdars were one such intermediary. They were also the holders of ranks or mansabs bestowed upon them by the emperors.

93. 'Shifa' means healing of sick; khana means place of isolation (for the sick). The term would mean that the sick were kept isolated in these Shifa-khanas. See also I.A. Khan, op.cit.
94. Bala, "The Ayurvedic and Unani Systems in Medieval India", Stud.His.Med., 1982, VI (4) pp.282-85; p.285.
95. These were special areas belonging to the royalty, marked for specific purposes. There is a reference in the text, Mirat-i-Ahmadi, to a complex containing a school, a mosque and a hospital built by Saif Khan at Jeetalpur in 1032.
96. Jagirdars were supposed to collect land revenue for the ruling king. Contradictions developed between them and the kings and lords mainly because of restrictions imposed on the former. They had to compensate for the loss, or trace the culprit in robbery cases; their jagirdari was not hereditary and was assigned for not more than three years.
97. Khan, op.cit.
98. Zahoori, op.cit.
99. Series of famines ravaging India during the time led to peasant exploitation; the latter's inability to pay high taxes guided them to migrate to other places. Peasant migration was then a central feature of agrarian life in Mughal India.
100. Conflicts between zaminards, nobles and kings ensued over the former making claims to a share in the land-revenue or surplus produce. The fiscal claim of the zamindars upon land lying within their zamindari existed almost throughout Mughal rule in India.
101. Setback in terms of non-State support or employment opportunities available to physicians.
102. Bala, op.cit.

C H A P T E R I I I

INDIGENOUS MEDICAL POLICY IN BENGAL

Just as the medieval Indian rulers accommodated the Ayurveda for its scientific essentials, the British, too, sought to adopt policies for utilising the extant indigenous forms of medicine in nineteenth-century Bengal. Thus with each new form of government in India, indigenous medicine came to acquire a new form of medical system.

The indigenous medical policy in Bengal may be summed up in three phases. In the initial phase, which lasted until the 1860s, there was a peaceful co-existence and incorporation of the indigenous forms of medicine. This was based upon the similarity of theories of treatment and the exploration of the pharmacopoeia.

In the second phase, the increasing professionalisation of medicine in Britain and standardisation of drugs led to tensions between the two forms of medicine. In each of the first two phases, the State, for reasons of economy, had an interest in promoting indigenous medicine and medical practice. Medical training formed an essential part of this policy. It was a force for co-operation between indigenous and western forms.

In the last phase, which started towards the turn of the twentieth century, there was a rise of chemical industry in Europe and the increasing professionalisation of medical practice. Western medicine, at this stage, exhibited great divergence from Indian medicine, and thus posed a far greater threat to indigenous medicine than in previous years. In response to this threat, the nationalist movement called for the regeneration and extension of indigenous forms of medical practice.

In the discussion to follow, I shall show that the friendly co-existence of Indian and Western systems of medicine commenced with medical training at the Native Medical Institution

which ended with the triumph of the Anglicists in introducing English language and European sciences in India. Nevertheless, interest in indigenous medicine continued in later years. This, as we shall see, was maintained firstly, by the investigation of indigenous drugs, and secondly, by the employment of indigenous medical practitioners for medical relief to the indigenous population.

Medical Training at the Native Medical Institution

At the beginning of the nineteenth century, the British authorities and practitioners of western medicine saw indigenous medicine as an area of opportunity suitable for research. In 1813,

thus, the Court of Directors stated that "There are also many tracts of merit, we are told, on the virtues of plants and drugs, and on the application of them in medicine, the knowledge of which might prove desirable to the European practitioners, and by such intercourse the nation might gradually be led to adopt the modern improvements in these and other sciences".¹

This was the first official statement of interest in assessing the significance of indigenous medicine. This view was based upon writings, such as those of Sir William Jones who wrote a memoir entitled Botanical Observations on Select Plants, between 1790-1800, and of Ainslie whose Materia Medica in Hindustan appeared in 1813.

The interest in indigenous medicine found expression in the establishment of the Native Medical Institution [hereafter, N.M.I.], followed by the Calcutta Sanskrit College and the Calcutta Madrasa where parallel instructions were carried out in indigenous and translated Western texts.

The proposed plan for the instruction of young Indian - Hindus and Muslims - to fill the position of native doctors on the Civil and Military Establishments of the Presidency of Bengal, was laid by the Government on the 9th of May 1822; the scheme was published as a General Government Order dated the 21st June 1822.² Definite

regulations were then to be framed for the N.M.I.; the Bengal Medical Board was assigned the task of submitting a detailed format of these regulations.³ A brief overview of these rules deemed necessary by the Board may help in our understanding of the policy regarding the selection of students for the Institution and their nomination as native doctors when sufficiently qualified after training; the school was also called the School for Native Doctors, and was the first of its kind in India. The number of students was restricted to twenty. A knowledge of Hindustani or Persian language was an essential prerequisite for admission. As such, no religious discrimination influenced the Board while drafting out the plan, which would mean that ethnic background of the students was not considered important for the purpose. Monetary support and subsequent employment of successful candidates acted as an incentive to the young aspirants. During the entire term of this professional pursuit, students were to be given a sum of eight Rupees per mensem. Students trained at the N.M.I. were, according to the orders of the then Governor-General, to be appointed in the Army.⁴ And the staff at the institution consisted of a Civil Assistant Surgeon⁵ assisted by two Indian assistants; Dr. John Tytler, a versatile Orientalist, was appointed Superintendent of the School.

Medical instructions at the School were imparted through the medium of Indian vernaculars. Dissection was carried out not on human but animal bodies, probably because of the religious aversion of Indian students to corpse. Short treatises on anatomy, medicine

and surgery were prepared and translated by the Superintendent for purposes of instruction. It was through these treatises that the students were familiarised with the nomenclature employed in medical science in Europe which may have been the initial exposure to western medicine in Bengal at that time. For practical training, however, students witnessed dissection of lower animals and post-mortem examinations of people dying in hospitals. The task of distributing students in different hospitals and establishments was left to the Superintendent as per the orders of the Medical Board. And those attached to European hospitals were placed under the apothecaries in these hospitals,

"to attend the hospital wards and dispensaries and to assist in dressing the patients in preparing and administering medicines"; while those attached to the Native Hospital in Bengal were to be placed under the medical officers "to assist in the duties of the Establishment".⁶

Further efforts were made by the State in Bengal in favour of the N.M.I. In 1824, for instance, the government sanctioned the printing of a vocabulary of medical terms in Persian and Nagri characters. And on the 10th of June 1824, a sum of Rupees 709 was sanctioned for the purchase of two skeletons from Messrs. Bathgate and Company.⁷ In 1826, medical education was extended by the institution of medical classes at the Calcutta Sanskrit College and

the Calcutta Madrasa, the former imparting instructions in Ayurveda and the latter in Unani medicine. Both centres of learning were aided by the government.⁸ It was the same year that the government raised the sanctioned number of students at the N.M.I. to 50 and appointed 4 assistants - 2 Hindus and 2 Mohammadans - to assist in teaching and hospital work. The education of each native doctor cost the government about Rupees 1,000.⁹

It was not until 1827 that Tytler started a series of lectures on Mathematics and Anatomy on the western pattern, at the Sanskrit College and the Madrasa. It is known that some of the students of this college [number not available], who had acquired a good knowledge of Anatomy and Physiology were appointed to responsible positions under Civil Surgeons or in hospitals. A letter of 25 May 1832 mentions the establishment of a small hospital which was attached to the Sanskrit College.¹⁰ In the year 1833, Dr. J. Grant, Superintendent and lecturer at Sanskrit College presented the first Annual Report of this hospital mentioning about 30 beds for in-patients; 158 out-door patients are stated to have been treated in the last eight months of 1832. Also, treatises on surgery and medicine were translated from the English into the Indian vernaculars; medical instructions on indigenous medicine were then carried out alongside these translated western medical texts. In the same year, more teachers were appointed to lecture to Ayurvedic students in Sanskrit and to teach them the works of Caraka, Susruta and Vagbhata. At the Madrasa, students were

familiarized with the works of Unani and Arab physicians; we do not know all the works which were utilized for the instructions, except a few, namely, Shuruh Asbab, Aksurace, Sudeedee and Anees-ool mosharra-heen.¹¹

Meanwhile, Tytler continued to translate medical treatises into Indian languages to make them easily accessible. He believed that

"the education of Indian pupils should be given in their own mother tongue, if possible, and that the English language should not be thrust on such a rich medium of instruction as the Sanskrit language".¹²

Thus, we see in these institutions the co-existence of and parallel instructions in western and indigenous medical science. In neither of these classes was dissection attempted.¹³ This may have formed one of the guiding principles in reframing the policy in 1835 which eventually led to the abolition of the N.M.I.; the events following this move shall be discussed later in this chapter.

The text-books were published by the government. For example, Pundit Madhusudan Gupta was paid Rupees 1,000 for translating Hooper's Anatomists' Vade-mecum.¹⁴ The following are known to have been translated and lithographed at the behest of the government:

1. Hooper's Anatomists' Vade-mecum
2. Physicians' Vade-mecum
3. Surgeons' Vade-mecum
4. Thomson's conspectus of the Pharmacopoeia
5. Fyfe's Manual of Chemistry and Conquest's Outline of Midwifery
6. Tropical Diseases by Twining and Smith
7. Plague by Dr. Thomas
8. Books on Vaccination.

The list gives us an idea of the various disciplines in western medical science which were considered significant for medical instructions at the N.M.I.

The period of training at the N.M.I. was restricted to three years. The curriculum included instructions on Pharmacy, Materia Medica, Physiology, and Anatomy, besides the practical training for which the students were expected to attend the Native Hospital, the General Hospital, the Company Dispensary, the Eye Infirmary and the Department of the Superintendent of Vaccination.

The government, in order to encourage this class of public servants and to attach them permanently to the government service, raised the pay of native doctors educated at the N.M.I. above the rates that had been then ordinarily allowed. It was raised to

Sonaut Rupees 20, instead of 15 in Garrison, and 25 instead of 20 in the field. With the same idea and policy, the government of Bengal decided to further advance the allowances after 7 years of service as native doctors - 25 Rupees in Garrison and 30 Rupees in the field. However, there was an element of stringency involved in this attitude - that of expecting the native doctor to enter into a bond to serve for a minimum period of 15 years, unless under sickness and disability, satisfactorily proved before an Invaliding Committee.¹⁵ Increased allowances were given as an incentive to native doctors to work in government employ. Shortly before the abolition of the N.M.I., the government and the Court of Directors, Bengal, approved the proposal put forth by the 'Approved Political and Military Committee' to include all native doctors of the N.M.I. in the list of persons eligible for pensions under the Resolution of 4 January 1831.¹⁶

The halcyon days of the N.M.I. and the medical classes at the Sanskrit and the Madrasa Colleges virtually came to an end in the year 1835 when the new policy of the State put an end to the earlier attempts to run occidental and western medical systems simultaneously. What that policy was and how it was implemented is the focus of the discussion that follows.

Review of Progress in Medical Education - Abolition of the N.M.I.

The first review of the progress of the N.M.I. was carried out by the Court of Directors in the year 1828.¹⁷ It indicated the

satisfactory state of medical education at the institution, but later reports for 1832 and 1833 indicated some defects in the system of medical training at the N.M.I.

The idea of the improvement of the N.M.I. was first conveyed by the Political and Military Committee, appointed by the Court of Directors in Bengal for the said review of progress, to the Governor-General in Council. The Committee was to frame new plans for admission of pupils, their education, examination and future employment, and also to improve the constitution of the institution.¹⁸ A suggestion by the Medical Board relative to the pay to be given to native doctors educated at the Institution when on leave of absence from their Corps, was also approved by the government. And with respect to the medical books for use in the N.M.I., the Committee selected and ordered for it articulated skeletons with an assortment of separate bones and a few wax models for teaching anatomy. The N.M.I. then continued to train native doctors in the field of western and Indian medicine, but evidently was unable to meet the expectations of the government. Critics viewed medical education at the N.M.I. as "deplorable"¹⁹ and in a "stagnant state";²⁰ prominent amongst those supporting this view was William Bentinck, the then Governor-General of India. The supporters of the N.M.I., on the other hand, did not agree with this. The disagreement between the two sides came to be expressed in the Orientalist-Anglicist controversy of 1835 [to be discussed later].

In 1833, the N.M.I. was caught up in the reformation tactics of William Bentinck. He appointed a Public Instruction Committee to report on the progress of medical education since the establishment of the N.M.I., and to suggest measures that would be expedient to adopt with a view to the better instruction of the people, including the arts and sciences of Europe. The Committee presented its report on 20 October 1834. While it acknowledged the merits of the N.M.I.²¹ in general, it set out the defects of the Institution in detail. According to the Committee, the N.M.I. was not properly organised. It explained that the tuition, period of training and examination system were inadequate and that courses on practical anatomy were non-existent. The desultory character of students' attendance on the practical means of instruction and the absence of a proper qualifying standard were added in the defects of the N.M.I.

In 1835, the members of the Committee were divided as to whether instruction should be in Indian vernaculars or English; advocates of the former were grouped as Orientalists and of the latter as Anglicists. Orientalists included John Tytler, Ram Comul Sen, H.H. Wilson; Anglicists included William Bentinck, T.B. Macaulay, Surgeon John Grant [and also Apothecary of the Company]. The controversy was resolved in favour of the Anglicists who laid down that

"a knowledge of the English language we consider as a sine qua non, because that language combines itself the circle of all the sciences and incalculable wealth of printed works and illustrations, circumstances which give it obvious advantages over Oriental languages, in which are only to be found the crudest elements of science, or the most irrational substitutes for it". 22

In addition, the Anglicists insisted that only European science be taught. Thus in 1835, following the triumph of the Anglicists over the Orientalists, Bentinck issued an order announcing the abolition of the N.M.I. in Calcutta. The decision was communicated in the Government Order number 28 of 28 January 1835²³ which included the following resolutions to be adopted by the State; "that the Sanskrit College medical class, the medical class of the Madrasa, and the N.M.I. be abolished from 1st proximo", "that students of the N.M.I. as are now capable of passing their final examination shall be appointed native doctors, and all other students of that institution be transferred to the native corps of the army, upon their present salaries, to become native doctors when represented to be duly qualified by a committee of medical officers, or, if not found qualified in two years to be discharged".

Following these resolutions, the N.M.I. was abolished and the medical classes at the Sanskrit and at the Madrasa Colleges were discontinued,²⁴ and replaced with the new medical college called

the Calcutta Medical College. The abolition of the N.M.I. did not mean the end of medical education in Indian vernaculars. Vernacular medical education [excluding instruction in indigenous medical science] was re-commenced in 1839, with instruction in Urdu and later in Bengali. Only one member [Pundit Madhusudan Gupta, an Ayurvedic practitioner trained in western medicine] of the staff of the N.M.I. is recorded as transferring to the new College.²⁵

The College was the pioneer institution of the East for a systematic education in western medicine. More about the Medical College will be discussed in our later chapters. It was placed under the control of the Education Committee and, according to the 1835 Order of Bentinck, was to be open for admission to all classes of people between the ages of 14 and 20 years, irrespective of caste or creed. Each of these pupils was to receive a stipend from the government of Rupees 7 which was to be increased gradually. The Order also decreed that instruction should be given through the medium of English which became the official language at the time. The alteration in the language of the country closely followed Macaulay's

"vehement and shallow attack on Sanskrit literature and his declaration that the content of higher education should be western, including science and that the language of instruction should be English".²⁶

This was an important stage in the history of medical education in India for it marked the end of the first attempt at synthesis of Eastern and western systems of medicine. This, alone, may have been enough to engender a reaction among the Indian enthusiasts and nationalists, in later years, to voice their opinion in favour of Indian medicine.

During the period of its existence - 1822 to 1835 - the N.M.I. had trained 166 native doctors in Indian and western medicine. In 1839, the government employed 305 native doctors in the Presidency of Bengal, of which 124 had received their education at the late N.M.I.²⁷ Other N.M.I. graduates found employment with the Gun Carriage Agency.²⁸ And after 1835, the focus of government policy shifted to Calcutta Medical College. [discussed in Chapter IV].

Indigenous Drugs

Although indigenous and western forms of medical training were separated in 1835, the interest was maintained in indigenous drugs, for these were cheaper and easily accessible. This resulted in Dr. O'Shaughnessy's Bengal Pharmacopoeia²⁹ which is the first book

of its kind dealing exclusively with the properties and uses of the medicinal plants used in Bengal, and was published in 1837. In that year also, the Governor General of India in Council, Bengal, established in Calcutta an efficient Medical laboratory for the purpose of preparing medicines, and the first consideration in his opinion was an indigenous pharmacopoeia, pointing out as far as they were then known or could be learnt, the properties of Indian medicines and their effects.³⁰ This, the government observed, could afford cheap and effective medical relief to the vast population and could also be used in Military and General Hospitals and Dispensaries.

Medical men appointed in charge of testing the efficacy of indigenous pharmacopoeia formed an important component of the State policy. An Apothecary General, for instance, who may have been of Indian origin well acquainted with indigenous drugs, and a Superintendent of the Botanical Garden, were included in the Dispensary Committee of Calcutta. Indian Compounders were appointed in almost all the Charitable Dispensaries in Bengal, for assisting in investigation.³¹ Dr. O'Shaughnessy, working with the government, also proposed to consult the extant authorities on indigenous materia medica for the purpose of selecting indigenous remedies and subjecting each to exact analysis and finally to prepare a sufficient quantity for administration and test in hospitals. Following these investigations, the indigenous drug, Cannabis indica, was added to the British pharmacopoeia, by

O'Shaughnessy, in the year 1839.³² The drug was included for the preparation of an extract and a tincture.

While these additions were being made in the medical personnel engaged in investigating the drugs, a clinical section, comprised of surgeons attached to the principal hospitals and the Medical Board, was subsequently constituted in order to convey the relevant results to the Medical Board. The Pharmacopoeia was printed at the expense of the government.³³

In 1841, western medical men introduced indigenous remedies in one of the dispensaries³⁴ in Bengal.³⁵ Country medicines such as Kala Dana, Kut Kelija were used.³⁶ There was more extensive use of drugs composed of opium and calomel during the 1839-40 cholera epidemic which ravaged the Presidency of Bengal claiming a heavy toll of life.³⁷ Success in utilizing these and other drugs with little or no side-effects may have contributed to continued State efforts in emphasizing indigenous drugs, as most of these in use at the Chittagong dispensary were "principally prescribed and found to suit very well";³⁸ this was clearly stated in the half-yearly returns of the Chittagong Dispensary.

In the next phase - in the 1850s - while indigenous pharmacopoeia formed a crucial subject of investigation in India, the pharmacopoeia in Britain at the time underwent significant changes. Thus the listing of officinal drugs, which achieved

official recognition following the Medical Act of 1858, came to be recognised by the General Medical Council in 1858 as the British Pharmacopoeia. This included the list of medicines and compounds and the manner of preparing them, together with true weights and measures by which they were prepared and mixed. New editions and addenda followed in quick succession after the first publication in 1864, and western practitioners in India took upon themselves the task of investigating significant aspects of indigenous pharmacopoeia.

An impetus to give State recognition to drugs in India came from the legal status ascribed to the British Pharmacopoeia, by the General Medical Council [hereafter, G.M.C.]. The historical survey of the standardisation of crude drugs has shown that the different methods used to control the quality of these substances had developed side by side with the increase in knowledge of the characters, properties and constituents of the plants and drugs involved. The succession of editions of the British Pharmacopoeia in Britain from 1864 to 1932 indicates that the microscopical studies in concurrence with advances assisted in characterising the drugs and also provided additional methods for ensuring the purity of drugs. These pharmacopoeiac essentials of western medicine, then, ensured the efficacy of drugs appearing on the market in Britain.³⁹

The standardisation of western drugs led practitioners of western medicine in India to be increasingly critical of the lack of refinement of indigenous medicine. They wished to increase the use of refined western drugs but the government, conscious of costs, wished to emphasize the use of local products, wherever possible. The tension between the government and western medical practitioners surfaced in 1866 when the latter complained that their indents for European medicines were either tardily or insufficiently supplied by the Medical Store Department at Calcutta. But the inordinate costs involved in procuring European medicines from England and introducing them in the bazaars of Calcutta made it almost impossible to continue the European drugs in the Presidency.⁴⁰

Considering the low costs involved in procuring dry medicinal substances [native in origin] in many bazaars in India, as compared to those involved in receiving them from England in processed form, the Medical Department declared that indigenous drugs be used more generally and "the ones available in a crude and uncouth form",⁴¹ as they put it, be given laboratory treatment before administration. The idea behind this was that either through the medium of the medical store depots in India, or by the assistance of the Commissariat Officers, these native drugs, of the most useful kind, should be provided for, and made available to all government dispensaries in the Presidency. These supplies were, accordingly,

"to be debited by Commissariat Officers against contingent bills of Jails and Dispensaries, and paid for by the Civil governing authorities".⁴²

Thereafter, several Indian medical officers and civil medical officers

"published 'ere long', a valuable pharmacopoeia of indigenous Indian drugs".⁴³

The Commissary General, too, was instructed to procure information regarding the best and cheapest markets throughout the land for valuable medicinal products and imports of India in general. Administrative medical officers were directed by the State to see that the indents of European medicines were diminished in accordance with the supply of good native drugs in their stead.⁴⁴

A.P. Howell⁴⁵ instructed to the Medical Department that

"supply of European medicines be limited strictly to those medicines for which no native drug could efficaciously be substituted. The government would then pay for such European medicines only and the local funds would be charged with the cost of the native drugs that could be used in substitution".⁴⁶

The compromise between practitioners of western medicine and the State in British India was seen in terms of careful and systematic testing, and refining the indigenous drugs for better

strength and simultaneous utilization of European medicines. The Calcutta Medical College formed the pivotal institution for implementing these plans. Experiments were, accordingly, conducted at the Medical College Hospital, and also in the Presidency General Hospital, for purposes of testing the value of various native plants.⁴⁷ The Pharmacopoeia of India was published under the aegis of the British government in the year 1868. This did not have the legal force of the British Pharmacopoeia and Chopra⁴⁸ and Arnold⁴⁹ argue that the eventual purpose of this scientific activity was the inclusion of Indian drugs in the British pharmacopoeia.

Extensive use of indigenous drugs was also made feasible by their introduction in the Calcutta Medical College as well as in medical schools of the Presidency. These, as also other regions in India, were apparently supplied with samples of important indigenous drugs; medical students were then familiarized and instructed on the properties and use of each of these.

The investigation and refinement of Indian drugs was only slowly achieved, but with the pressures which made them so economically attractive, the use of such drugs could not be abandoned. As a consequence, there were periodic calls for new efforts at refinement and standardisation.

Gradually, local committees, in agreement with government policy, proposed to prepare a revised edition of the Pharmacopoeia of India. And in October 1895 a committee was formed, headed by Surgeon G. King and J.F.P. McConnell [Professor of Materia Medica at Calcutta Medical College]. The Committee's task of finding out means of extending the use of indigenous drugs closely followed the recommendations of the Indian Medical Congress held at Calcutta in December 1894.⁵⁰ The following issues were central to the various objects:

- a. to find out ways of encouraging the systematic cultivation of indigenous medical plants;
- b. increasing the use of indigenous drugs of known therapeutic value at various Medical Depots in Bengal;
- c. to sanction the manufacture of stable preparations of certain drugs at these Depots.

In the late nineteenth century, western medicine moved away from indigenous medicine. The increasing professionalisation led western practitioners in Britain as well as in India to discard the humoral basis of diagnostics in medicine. This attitude gained strength by the rise of the drug industry in Britain, influenced by Germany which had the leading pharmaceutical industries at the time. As a consequence, western practitioners came to regard indigenous medicine as necessarily inferior.

Thus Indian and Western practitioners, trained in western medicine, began to distance themselves from the textual and cultural contexts in which the indigenous drugs were located.⁵¹ One Uday Chand, for instance, in his *Materia Medica* of 1877, edited out the sections on humoral observations in indigenous medicine which, he said

"were not so much the result of observation and experience as the outcome of an erroneous system of pathology and therapeutics".⁵²

Similarly, M.C. Koman, in his report on indigenous drugs to Madras government in 1921, condemned the humoral diagnostics and therapeutics which could not "hold against the rational physiology of the day".⁵³

The divergence of indigenous and western systems of medicine probably became evident at this stage of British rule in India. The response of the practitioners of indigenous medicine to the above rejection of humoral basis was twofold - [a] some challenging the theories of Indian medicine, thus falling in the stream of those discarding it, while [b] others proposing further research in indigenous medical science, with a view to remedying these 'defects'. In the former figures the reaction of Hakim Afdal Ali who, in his 'Jamiush-Shifaiya', remarked, in 1879, that most of the indigenous theories of medicine were based on wrong presumptions.⁵⁴ As for the second group above, they proposed

the improvement in the light of western medicine. And on one occasion, Mahatma Gandhi, communicating his criticism of indigenous medical systems pointed out the 'unsatisfactory' state of these systems.⁵⁵

Even though Indian and European practitioners of western medicine, and also of indigenous medicine, were discarding as well as challenging these theories, indigenous medicine continued to thrive under the aegis of the few indigenous physicians who, in 1878-79 established a dispensary at Calcutta to propagate knowledge of Indian medicine through inexpensive books on the same. In order to make sure that traditional systems were not wiped out, the protagonists of Indian medicine funded pharmaceutical concerns to manufacture and sell indigenous drugs. This, however, enabled the kabirajes [or Vaidas] to earn considerable wealth so that they were at one time, what Gupta claims, "among the richest men in the world".⁵⁶

The founders of the drug industry in Britain⁵⁷ were in fact the descendants of the drug makers of eighteenth and nineteenth centuries. There were three main processes turning drug-making into a highly organised industry.⁵⁸ The first was standardisation. The drug-makers refined their products, published their formulae and the action of the products, and advertised them widely. The second was the advances in the fields of bacteriology, pharmacology and immunology, as also in chemistry. Louis Pasteur's

theory of infection, for instance, stimulated the advances of the British surgeon, Lister, in antiseptic surgery, and led to the introduction of carbolic in the hospitals in Britain. Manufacture of this and other drugs then aided in the flourishing of the firms producing them. The British taste for commercial work in drugs - that is, bringing them to the market level for sale - was to a large extent influenced by the German pre-eminence in synthetic chemicals. The discovery of Salvarsan by Paul Ehrlich for the cure of syphilis gave an impetus to industrial research at an international level for it led to the search for more chemotherapeutic compounds and drugs. The third was the development of improved techniques of industrial manufacture of drugs. Vacuum distillation and new tableting processes, for instance, helped to produce drugs more cheaply.

Indigenous medicine did not keep pace with these advances in western medicine, yet the interest in indigenous medicine among practitioners of western medicine, though weakened, did not disappear. Dr. E. Houseman, member of the Bengal Medical Council of Registration, for instance, proposed to train practitioners of indigenous systems so that western practitioners could obtain assistance in their practice from a knowledge of indigenous drugs and methods of treatment. For in Houseman's view, indigenous medical systems were capable of considerable expansion and improvement and

"could derive benefit from this association with-western medicine".⁵⁹

In 1907, the Hitavadi recorded the new move of the State in . inaugurating a Commission in Bengal for inquiring into the efficacy of the treatment of the sick according to the Ayurvedic and Unani systems of medicine.⁶⁰

Others in medical administration, showed continued interest in Indian medicine. Pardey Lukis, Director General of the I.M.S., for instance, on the subject of patronising these systems, fervently commented in his letter to the Bengal government that

"there is much that is good in the Ayurvedic systems, and there can be little doubt that for many years to come the majority of Indians will continue to be treated by this method".⁶¹

Not only did he recommend the establishment of definite teaching institutions and Boards of Examiners in the indigenous systems of medicine, he also suggested that a teaching institution where indigenous methods were most flourishing be taken as the "focus of initiating this improvement".⁶² These pronouncements must be seen in the light of pressure from Ayurvedic nationalists during the period which is why the Bengal government probably agreed, in 1918, to finance the maintenance of Astanga Ayurvedic College - after turning down the proposal of the Board of Directors of Ayurvedic Medicine Manufacturing Company, in 1910, to found an Ayurvedic Medical College;⁶³ a sum of Rupees 9,000 was to be given by the government for the College.⁶⁴

Indigenous drugs such as Neem, Chirata and Anantmul which were sold by medical men at the Medical College, were picked out from the published list which, in turn, may have been done at the behest of the State. The best doctors of western medicine of the Bengal Presidency, as pointed out by the Governor in Council, in the first decade of this century, used a well-known Ayurvedic drug called Makara Dhaj⁶⁵, for treatment of cases of typhoid and other ailments;⁶⁶ following this, several local committees were asked to submit a list of drugs found useful for malarial fevers and bowel complaints.⁶⁷ As a consequence, the supply of European medicines was discontinued.⁶⁸ Ghosh⁶⁹ attributes the increasing utilization of indigenous drugs in this period to difficulties in obtaining supplies of drugs from abroad as a consequence of World War I. According to him, acute necessity was then felt for developing and utilising local resources as far as possible. The Englishman⁷⁰ of Calcutta reported the cutting off of Central Europe, following the War, as a source of supply of medicinal plants, which probably gave impetus to the cultivation of more vegetable drugs in India. Ghosh, who was a graduate from England and a Pharmaceutical Chemist at the Government Medical Stores Department in Bombay, proposed the attachment of an experimental drug farm to the Calcutta School of Tropical Medicine for the cultivation of drugs.⁷¹

The Government move in appointing yet another Committee a decade later, in 1930, to inquire into the strength and purity of

the drugs and medicinal preparations sold in the Indian markets, was viewed with suspicion by the Indian population. The appointment of the Committee was related to a period of political unrest in India and there was suspicion that it was a move on the part of the government to counteract the Congress Campaign of the boycott of British drugs.

The objective of the Committee, called the Drugs Enquiry Committee, which was "to find out the extent to which indigenous drugs of impure quality or defective strength were manufactured and sold in British India"⁷² was enough to arouse indignant reaction from Indian nationalists. By this time, European drugs had gained a hold over the drug market and the government was charged with a lack of encouragement of the indigenous drug industry.⁷³

Expansion of the drug industry in Britain became more apparent after the First World War, prior to which the British relied heavily on Germany for her pharmaceutical products;⁷⁴ Germany, at that time, dominated the world pharmaceutical market. However, lack of their supply with the outbreak of war forced the expansion and increase of medical experiments and research to meet wartime needs. A similar process operated during the Second World War. Between 1937 and 1946, sales in Britain nearly trebled to 58 million pounds.⁷⁵ In the post-war period, thus, while research academic laboratories continued primary research on therapeutically significant compounds, the firms investigated to develop and produce

them. This marked a clear shift from research by scientists working in medical school laboratories to the research department of commercially motivated firms. Production of antibiotics was an important achievement of these firms.⁷⁶

The changing policy towards indigenous drugs in British Bengal is summed up in three phases. One, in the early nineteenth century, the State encouraged the examination and use of indigenous remedies. Two, as the century progressed, State policy was directed towards clinical investigation of the indigenous pharmacopoeia in three different ways; firstly, testing them in the light of western medicine; secondly, introducing them in medical schools, colleges and dispensaries which also familiarized the students and the working personnel with indigenous drugs; and thirdly, limiting the influx of European medicines vis-a-vis native drugs.

Third, by the late nineteenth century, the plausible significant indigenous drugs were incorporated into the western pharmacopoeia. As a sequel, the indigenous drug market started to dwindle so that by the end of the third decade of the twentieth century, dominance of European drugs in the Indian market was more or less complete.

Indigenous Medical Practitioners

Initial attempts to employ indigenous practitioners were made in the early nineteenth century in Bengal. Arnold⁷⁷ lists 10-15 tikadars [inoculators] as practising in 1830, about 30 by the year 1844, and as many as 68 by 1850. Indigenous medical practitioners, thus, helped in taking western medicine to a popular level.

In the 1860s, various schemes to extend the use of indigenous practitioners were proposed. For example, the Joint Magistrate in-charge of Sylhet, an area which lacked formal medical facilities of any sort, proposed that instead of establishing hospitals or dispensaries throughout the district,

"a greater advance might be made by the improvement of native practitioners or kabirajes".⁷⁸

These practitioners could be induced to attend and take lessons in the western system of medicine at a new establishment. At the outset, the pupils were to be given one or more of the surgical instruments for learning to perform operations, along with a small supply of the most necessary medicines. The benefits of such an establishment, Smith recognized, would be appreciated once the people became familiarized with the European methods of treatment. The possible benefits accruing from this also find a place in the letters written by H. Bell, Secretary to the GOI, to the Officiating Commissioner in which

Bell stated that

"the plan for instructing the native kabirajes will, if attended with success, promote very materially the knowledge of European science".⁷⁹

The idea here was to utilise indigenous practitioners in order to popularise western medicine, alongside the utilization of indigenous drugs. The proposal did eventually meet the consent of the government. Wealthy Indians and Europeans equally contributed towards the expenses of the dispensary, while the government agreed to supply the necessary establishment of servants, instruments and medicine. Indigenous medical men were to be given a monthly salary of Rupees 40 besides medicines, and other expenses were then defrayed by the Dispensary Committee. We do not know whether the above proposal was actually implemented, except that it met the approval of the Government of Bengal.

The government's attempt to introduce western practices and combine them with indigenous practices was advanced by the translation into Urdu in 1861 of the nomenclature and classification of diseases. Eventually, copies of these were, by State orders, distributed for general use both in the British and Native Armies and in all Jails and Dispensaries.⁸⁰

In other areas of India, schemes to utilise indigenous practitioners were successfully introduced. For example, Major

Mercer initiated a scheme in the district of Sealkote in Punjab⁸¹ which introduced village dispensaries managed by elected hakeems headed by a superintending hakeem in each district.⁸² The Commissioner of Nuddea District in Bengal pressed the government of Bengal to introduce a similar scheme. But along with similar proposals, this failed to meet the approval of the Lieutenant-Governor and was not implemented.

The health conditions in the villages of Bengal were very poor, probably as a consequence of a series of famines which had ravaged the area, and the incidence of disease was seen as a threat to the British population in neighbouring areas. The government acknowledged the need to raise a body of local medical practitioners who could successfully extend their services to poorer classes and to the interior of each district in Bengal. However, how precisely this was to be done was not generally agreed.

In 1869, Dr. Bholanath Bose, Civil Surgeon, Bengal, framed a scheme to meet the demands of the "ailing population". Bose proposed the establishment of a temporary medical school in each district of Bengal, with a hospital attached to it. Each school was proposed to consist of a sub-Assistant Surgeon and an indigenous practitioner accompanied by other staff and servants. Trainees were to be granted stipends and a free supply of books as an incentive. Practical training and a year-long course of study formed an essential part of the proposed scheme. Thereafter, successful

candidates were to be given certificates or licences to practise in their village.

Dr. D.B. Smith, the then Sanitary Commissioner of Bengal, expressed his unwillingness to implement Bose's scheme. For Smith, to expect a youth after a year's tuition from a sub-Assistant Surgeon or an indigenous doctor on indigenous drug to meet the medical needs of the people, seemed infeasible. He feared

"their inability to tackle complicated diseases like fever, dysentery, cholera and other health hazards prevailing in Bengal at the time".⁸³

And the short period of training in medical education and bestowal of certificate or medical licence to practise medicine, as proposed by Bose, apparently formed the basis for such a disapproval.

Bose planned to familiarize students with a practical knowledge of indigenous drugs, namely Bhaunt, Indrajob, and several others of recognised significance; the former was used as a general cure for all febrile ailments and the latter for diarrhoea, dysentery and cholera. The total cost of schools and hospitals, estimated at Rupees 1,000 a month for each district, would, as Bose proposed, be met by the State initially, and later recovered by donations and monthly contributions from the public - by a small cess on Zamindars and a similar cess on villages supplemented by a small license fee from young doctors throughout the district. Finally, trained

doctors were to be employed as pound-keepers, vaccinators, local sanitary officers and later allowed to practise in their home villages or districts. As for the text-books to be used, Bose ventured to undertake the preparation of such books in the vernacular as would be necessary for use in medical schools.

Smith's refusal of acceptance of the proposal was, in part, based upon its over-reliance, as he saw it, on indigenous medicine. He believed the government should direct its efforts towards

"much-needed improvement of other and better systems already in existence".⁸⁴

He argued that

"if the scheme be taken up and prove unsuccessful, it will bring direct discredit to the educational system controlled by the government".⁸⁵

The crowning weakness of Bose's scheme, according to Smith, lay in his idea of employing trained medical men as pound-keepers, vaccinators and in other subordinate positions. Young medical protégés of the State should not be converted into tax-collectors and policemen. Seen in its entirety, the plan, as offered by Bose, was regarded by Smith as unworkable.

Smith, however, agreed that the indigenous products were important and the only way to utilise them was through the few learned kabirajes in Calcutta who had been practising the profession for a considerable length of time.⁸⁶ The kabirajes, Smith suggested, might prove beneficial if two or more carefully selected and leading ones were given an opportunity to treat medical cases in a small hospital established by the government. This would allow them the opportunity to express what they know, the tenets to which they adhere and the doctrines which they inculcated. English physicians might acquire from them the useful information regarding indigenous drugs. The leading practitioners in Calcutta might also teach the class of Indian medical students at the Calcutta Medical College. He also recommended establishment of district medical schools as a preliminary to regular College education, and provision of English standard drugs to village centres at reasonable rates.

But, as mentioned above, none of these schemes - Mercer's, Bose's and Smith's - met the approval of the then Lieutenant-Governor of Bengal. While he acknowledged the good principles behind each of them, he thought it better to send a few apprentices - about 5 in each district - to work with the Civil Surgeon and acquire a practical knowledge of common drugs and the basic principles in medicine. They would be trained for three years at a government establishment supported by the government with reasonable subsistence allowance increasing every year, and during the course of their training be employed as Dressers, Hospital Apprentices and

Compounders in the Civil and Jail Hospitals and the Dispensary. At the end of the third year, successful students would get a licence to practise in their villages. The scheme outlined above was quite similar to the one proposed by Bose, except that the period of training in the Lieutenant-Governor's scheme was extended to three years instead of the initial one year, and that the emphasis was upon western medicine. The Lieutenant-Governor approved Smith's proposal for the sale in the interior of certain European medicines such as Quinine, Jame's powder, and Dover's powder at cost price.

Sale and distribution of these drugs was made feasible by the inclusion of medical as well as non-medical personnel in the proposed plan. The medical officer of the district and his subordinates, for instance, as well as the zamindars were involved in carrying out the assigned task. In contrast, the kabirajes of Bengal were excluded by the Lieutenant-Governor for purposes of extending medical relief. The only good that he thought could be obtained from the Indian systems of medicine, was the training of experienced medical men in the use of indigenous drugs. Proposals to support indigenous practitioners as such were then turned down.

As an experimental measure, a school was established with the Mitford Hospital in Dacca in Bengal, in the later months of 1869, where the Civil Surgeon assisted by competent sub-Assistant Surgeons

gave regular instructions in anatomy, surgery, materia medica and minor surgical operations. At the end of the three-year apprenticeship, it was left to the students either to continue in government service as compounders and subordinate indigenous physicians to go back to their villages.⁸⁷ Since the purpose behind all these efforts was to temporarily reach the ailing masses, and thus to protect the British population, the graduates may have been encouraged to serve in villages. And in times of epidemic, they were assured of government employment.⁸⁸

Yet another plan for utilisation of the services of village compounders or kabirajes, who had set up as local practitioners after some training in government service in dispensaries, was put forth in 1873 by Metcalfe, the Magistrate of Burdwan District. Metcalfe intended to employ them in the fever-stricken villages of Burdwan district. Failure to implement this plan was a result of the disagreement at the two levels of State machinery - legal in which Metcalfe was involved, and medical in which Dr. G. Saunders, the Deputy Inspector General of Hospitals in Bengal was involved. Metcalfe's plans did not comply with those of Saunders who suggested that kabirajes be collected from different parts of the Province and be supplied with a quantity of the most useful medicines only, wherewith they could treat fever, dysentery, diarrhoea and dropsy, all prepared at Burdwan under the supervision of the Civil Surgeon. With each of these packets of pills, powders and mixtures, there were to be added instructions drawn up in the vernacular for the

compounder's guidance. However, care was taken

"not to allow any margin whatsoever for the prescriber's intelligence" - that is the compounder - "in regard to treatment".⁸⁹

This may be said to mark a vivid distinction in the idea underlying the two policies with respect to utilization of indigenous practitioners. While the scheme proposed by Bose and Smith emphasized the improvement of existing indigenous practitioners by training them in western medicine for effective medical relief in rural areas, that of Saunders was an attempt to include medical men as mere 'assistants' or 'helpers'. The former may indicate support in terms of the quality of indigenous medicine - that is, focusing on the medical knowledge which was sought to be improved in the optic of western medicine; the latter, however, was more in terms of quantity involving use of a larger subordinate medical personnel in the form of helpers.

Utilization of indigenous practitioners may have continued in the years following these proposals. And in 1907 a meeting was held, in Delhi this time, in aid of Unani^{and} Ayurvedic systems of medical treatment and to discuss the employment of hakeems and vaides by local bodies. The Director General of the IMS, G. Bomford, accepted the Lieutenant Governor's proposals for giving Commissioners of districts all over India a free hand to permit

employment of vaides and hakims by municipal and local boards and of raising the allowance from Rupees 15 to Rupees 22 a month.⁹⁰

Three categories of medical practitioners then seem to have appeared on the scene in British Bengal in the late nineteenth and early twentieth centuries. The first one involved practitioners who were staunch advocates of Indian medicine and who continued to practise successfully. The second category was comprised of Indian and European practitioners of western medicine who merely saw the indigenous systems of medicine, as Arnold⁹¹ claims, as a source from which they could extract whatever they wanted to use within their own system, the rest was discarded as 'junk'. The developing British pharmacopoeia in Britain at the time was then a precursor to these developments. In the third category were included practitioners of indigenous medicine for whom the best means of bringing their system of medicine in level with western medicine was to revive and research on indigenous drugs in the light of western medicine. State encouragement to stimulate proper study of literature and research in indigenous medicine was regarded as a necessary prelude to this improvement.⁹² These practitioners proposed in 1917-19 the establishment of a separate Ayurvedic Board

"as a preliminary step towards the proper study of and research in the Ayurvedic systems of medicine".⁹³

Their belief that a study of indigenous medicine under the patronage of the university supporting research was perhaps based on getting benefits or access to the status of university degrees. Kaviraj Jaminibhushan Ray was an important figure at the helm of these developments. He founded the Astanga Ayurvedic College in 1916-17 and included in the medical curriculum parallel instructions in the Ayurveda and western medicine.⁹⁴ However, it was almost twenty years later when, with the rising nationalistic pressure, the State Medical Faculty of Indian Medicine was established.

Summing Up

The simultaneous flourishing of indigenous and western forms of medicine was not only because of State patronage but also because of the similar basis of treatment and diagnosis so that one system did not threaten the other. Investigation of indigenous drugs and employment of indigenous practitioners were a significant effect of this.

The insistence on English as the medium for all recognised forms of knowledge in itself disadvantaged indigenous forms of medicine. With the introduction of English, it was well-nigh impossible for training in Indian medicine to follow a format that would meet the approval of the British State. This may have been founded upon imperialist hauteur at its best, but the rise of the

chemical and drug industry and the growing profession of medicine in Britain created a vast gulf between Indian and Western medical sciences which was getting wider every day so that by the second decade of this century, many Indians, too, believed that it could not be breached. How this divergence was created by the differing levels of professionalization of Indian and Western medicine is the subject of our next chapter.

F O O T N O T E S, Chapter III

1. B.D. Basu, History of Education under the Rule of the East India Company, 1867, Calcutta, p.20.
2. D.G. Crawford, A History of the Indian Medical Service: 1600-1913, 1914, Vol.II, London, W.Thacker. See also R. Jeffery, Health and the State in India, 1985, Ph.D. thesis, University of Edinburgh.
3. Proceedings of the GOI, Home Dept., Medical Branch, 1 April 1822-27 June 1822.
4. A European doctor trained in western medicine.
5. Proceedings, 1822, op.cit.
6. Centenary Volume of the Medical College, Bengal : 1835-1934, Calcutta, 1935, p.1.
7. W.C.B. Eatwell, "On the Rise and Progress of Rational Medical Education in Bengal", Medical Tracts : 1839-1879, 1880, pp.1-28; p.16.
8. Ibid.
9. Centenary Volume, op.cit., p.6.
10. Extract from the Report of General Committee of Public Instruction, 1833, Vol.12, pp.32-37.
11. K.G. Sarbadhikari, "The Early Days of the First Medical College in India", Ind.J.Med.Edn., 1961, Vol.4, pp.293-298; p.294.
12. Eatwell, op.cit.
13. Ibid.
14. Proceedings, 1822, op.cit.
15. India and Bengal Despatches, Public Letter, July 1834.
16. Bengal Despatches, Public Dept., Feb.1831 - 27 Dec.1833.
17. India and Bengal Despatches, Public Letter, 1835.
18. Anonymous.
19. Ibid.
20. Despatches, 1835, op.cit.

21. Centenary Volume, op.cit.
22. Ibid.
23. Anonymous, op.cit.
24. Ibid.
25. Centenary Volume, op.cit.
26. Ibid.
27. K.C. Sarbadhikri, "Western Medical Education during the Early Days of British Occupation", Ind.J.His.Sc., 1961, p.32.
28. Bengal Despatches, Military Dept., 4 April 1832.
29. Proceedings of the GOI, Home Dept., Medical Branch, Sept.-Oct. 1837.
30. D. Arnold, "Medical Priorities and Practice in Nineteenth-Century British India", South Asia Res., Vol.5, no.2, 1985, pp.167-183.
31. Half-Yearly Reports of the Government Charitable Dispensaries. Bengal Medical Dept., Aug. 1840 - Jan. 1842.
32. G.E. Trease, Pharmacy in History, 1964, London, Tindall and Cox, p.197.
33. Half-Yearly Reports, Aug. 1840 - Jan. 1842.
34. Ibid.
35. Name not known.
36. Proceedings. Sept. - Oct. 1837, op.cit.
37. Ibid.
38. Half-Yearly Reports, Aug. 1840 - Jan. 1842, op.cit.
39. See B. Jackson, "From Papyri to Pharmacopoeia", in F.N.L. Poynter (ed.) The Evolution of Pharmacy in Britain, 1965, pp.151-164.
40. Proceedings of the GOI, Medical Branch, July - Dec. 1860.
41. Proceedings of the GOI, Medical Branch, July - Dec. 1866.
42. Ibid.
43. Ibid.
44. Ibid.

45. He was the then Under Secretary to the Government of India.
46. Proceedings of the GOB, Home Dept., 7 Jan. - 25 March 1871.
47. L.G. Mathews, History of Pharmacy in Britain, 1962, E. and S. Livingston, Edinburgh, p. 90.
48. R.N. Chopra, Indigenous Drugs of India - their medical and economical aspects, 1933, Calcutta.
49. Arnold, 1985, op.cit.
50. Indian Medical Congress, Report, 1894.
51. Arnold, op.cit.
52. U.C. Dutt, The Materia Medica of the Hindus, 1877, Calcutta, pp.iii-v. See also Arnold, 1985, ibid.
53. M.C. Koman, Report on the Investigation of Indigenous Drugs, 1921, p.3.
54. M.Z. Siddiqui, 1971, op.cit., p.273.
55. Ind.Med.Gaz., 1921, vol.56, p.189.
56. B. Gupta, "Indigenous Medicine in Nineteenth and Twentieth Century Bengal"; in C. Leslie (ed.) Asian Medical Systems: A Comparative Study, California University Press, pp.368-378, p.369.
57. W. Breckon, The Drug Makers, 1972, London, The Bowering Press, p.15.
58. Jackson, op.cit. See also Breckon, ibid. The drug makers who were the family chemists and druggists were the descendants of 16th and 17th century apothecaries who broke away from the grocers in 1617 when they were granted their own charter by the State but this brought them into conflict with the doctors for it allowed them to prescribe as well as dispense drugs. By the beginning of the 18th century, many of them had gained reputation as medical advisers and dispensers which perhaps divided the profession into two groups - those concerned with medical practice and those with manufacture.
59. Proceedings of the GOI, Home Dept., Medical Branch, Aug. 1912.
60. Report on the Indian Newspapers and Periodicals in Bengal, Jan.-Dec. 1915. See also J.C. Ghosh, Indigenous Drugs of India: Their Cultivation and Manufacture, 1918, Calcutta.
61. Proceedings, Aug. 1912, op.cit.
62. Calcutta University Report, op.cit.

63. Proceedings of the GOI, (Edn. Hlth. and Lands) Home Dept., Medical Branch, 98-99B, July 1910.
64. Ibid.
65. Proceedings of the Bengal Legislative Council, Jan. - Dec. 1918.
66. Ibid.
67. Report of the Proceedings of the Central Indigenous Drugs Committee of India, vol.1, 3 Jan. 1896 - 21 July 1899, Calcutta.
68. Proceedings of the GOI, Home Dept., Medical Branch, June 1907, 75-77A.
69. J.C. Ghosh, Indigenous Drugs of India: Their Cultivation and Manufacture, 1918, Calcutta.
70. Pharmaceutical Journal, 9 May 1917. See also Ghosh, *ibid.*
71. Proceedings of the GOI, E.H.L., Aug. 1901, 14-45B.
72. Report of the Drugs Enquiry Committee, 1930-31, Madras.
73. Ibid.
74. Jackson, *op.cit.*
75. Breckon, *op.cit.*, p.23.
76. Ibid.
77. Arnold, *op.cit.*, p.197.
See also Board's Collections, F/4/297, No. 6889, 1806, IOL.
78. Proceedings of the GOB, Financial Dept., Medical Branch, March 1862, 58-62.
79. Ibid.
80. Ibid. See also Proceedings of the GOB, Financial Dept., Medical Branch, July 1869, 74-75.
81. Proceedings, July - Dec. 1866, op.cit.
82. See Hume, *op.cit.*, p.52.
83. Proceedings, March 1869, op.cit.
84. Proceedings. July 1869, op.cit.
85. Ibid.

86. Ibid.

87. Ibid. See also Proceedings, Aug. 1901.

88. Ibid. See also Proceedings of the GOB, Financial Dept., Medical Branch, Feb. 1873.

89. Proceedings, Feb. 1873.

90. Proceedings, June 1907, op.cit.

91. Arnold, op.cit.

92. Calcutta University Commission Report, 1917-19, vol.III.

93. Ibid., vol.VII.

94. Proceedings, Jan. - Dec. 1918, op.cit.

C H A P T E R IV

IMPERIALISM AND MEDICINE IN BENGAL: ATTEMPTS AT PROFESSIONALISATION

Sociological studies on Professions rarely, if ever, deal with underdeveloped countries. Most of the sociological literature is about developed countries and does not apply to the underdeveloped world. 'Professions', in general, in the industrialised world are seen as providing a basis for prosperity and democratic future.¹ This view has been transmitted to the underdeveloped world - India, for instance - where conditions for the rise of professions did not exist. Jeffery² postulates two main causes of this situation - the dominant position of the State in India, and the disarticulation of the Indian society brought about by the Imperial State.

The term 'Profession' may be defined as an occupation³ exhibiting 'professional' attributes such as autonomy in terms of working situation, State-sanctioned monopoly managed by the professionals, community-oriented code of ethics and the period of training, and higher prestige and status associated with it. This is the general definition of 'Professions' which is derived from two different approaches to their study. One of these, followed by Carr-Saunders and Wilson⁴ and Parsons, includes a series of traits or attributes which represent the core elements of Professionalism. Johnson⁵ refers to this as the 'Trait' model of professionalism.

The other approach is that of Gayarmati⁶, Johnson⁷ and Friedson.⁸ This stresses the use made of training and other professional elements to legitimate privileged positions - privileges which the profession wishes to gain or has already gained. The basic difference in the two approaches seems obvious. For the former, as Jeffery⁹ claims, the granting of monopoly and the achievement of autonomy are, to a large extent, dependent on the fulfilment of the required criteria or attributes - the long period of professional training and community orientation; for the latter, monopoly and autonomy are legitimized through these attributes. In other words, in the second approach, developments of 'elements' can be seen as a means to achieve an end in terms of autonomy and monopoly; in the former, autonomy and monopoly are seen as an end in themselves - their existence and association with all professions is taken for granted which, in turn, is supported by the above elements.

In addition, Parsons defines professions as a cluster of occupational roles, that is roles in which the incumbents perform certain functions valued in the society in general, and by these activities, typically 'earn a living' at a full-time job. The members of a profession thus sell their professional skill to a large number of clients and are bound together by a code of practice which stresses social responsibility. This means that its typical member is trained by a formally organized educational process so that only those with the proper training are considered qualified to

practise the profession.¹⁰ Parsons made a distinction between business and professions and maintained that

"while business and the professions shared much in common in industrial societies, the professions were still to be distinguished by their collectivity-orientation rather than self-orientation. Such an orientation ensured that science would be applied in the service of humanity.¹¹

The association of professions with self-employment neither has been nor is an exclusive requirement of a profession in western societies. The term was typically applied to the Church and the Army in the period before the nineteenth century, and in the twentieth century is applied to groups of employees such as social workers and town-planners. In addition, employment status is becoming a more usual condition for members of "traditional professions".

Prandy¹² et al., in examining the growth of professions in nineteenth century and the transformation of professions established thereafter, argue that the sale of skills to a large number of clients need not be the defining characteristic of a profession. They believe that the central characteristic uniting professions in the nineteenth and twentieth centuries in Britain is not autonomy and private practice, but State sanctioning of monopoly practice.¹³

At the beginning of the nineteenth century, indigenous medicine was in terms of professional traits highly professionalised. It had autonomy in terms of working situation, had the monopoly sanctioned by the priests and rulers at the time, and was directed towards the community in terms of medical help. In addition, the medical training was imparted in the Tols for a period of two years, on the successful completion of which the student was recognised as a qualified physician for the practice of medicine. And lastly, it had the high prestige and status as other significant traits characterising it as highly professionalised.

The challenge to indigenous medicine then was not by private practitioners of western medicine but by western practitioners who were State employees. And in nineteenth-century India, the loss of autonomy by medical practitioners was necessary to maintain a situation of advantage by gaining a stronghold in State employment. In addition, the State in this case usually acts as the employer purchasing 'labour' in terms of professional services.

Regulation of medicine in India was to a great extent influenced by the policies in Britain at that time. In India, however, State patronage has been historically very significant and has always occupied a dominant position. The consolidation of the British empire in the second half of the nineteenth century roughly coincided with the growth of professionalism in Britain. This was also the period during which the major British professions -

medicine, law, architecture, accountancy and engineering - were undergoing rapid transformation. Professionalisation of medicine in India was thus a part of the colonial nature and represented British attempts to carry over the medical practices of an industrial society into a vastly different developing society.

As discussed in Chapter II, Indian medicine in ancient and medieval times was a stable and professionalising system, flourishing with extended support from its advocates. The situation was, however, different in Britain over the same period. By the end of the twelfth century, the Church in Britain had gained a considerable hold over the country's wealth and property, and all forms of intellectual activity.¹⁴ This monopoly faded as the Friars [members of the mendicant monastic orders in the Church] began teaching in towns. This created more opportunities for literate men outside monasteries. In late Middle Ages, however, contempt for clergy was generated with the decline of the monastic discipline. Between 1536 and 1539, Henry VIII dissolved the monasteries. A strong link was maintained between the Church and the work of physicians, lawyers, secretaries, architects, teachers and diplomats. During the twelfth and thirteenth centuries, the clergy were prohibited from practising medicine and law. With the gradual secularization, however, there was a division into physicians, surgeons and apothecaries which began to organize. Law represented the first secular profession to be organized with the establishment of a permanent Court at Westminster.¹⁵ Teachers continued to be

associated with the Church through universities which were still dominated by ecclesiastics.

The profession of medicine in Britain continued unorganized until about the sixteenth century when the Company of Barber-Surgeons and the Royal College of Physicians of London were formed; the former was transformed into the Company of Surgeons in 1745. The surgeons separated from the barbers; the apothecaries had secured their separation from the grocers and had developed their claim to be regarded as medical practitioners, partly because of their training and partly because of the assistance they rendered to physicians. The Society of Apothecaries in London then began to orientate examination and teaching toward the study of medicine. By the end of the eighteenth century, the apothecaries had shed their occupation as druggists to form another branch of medical science called pharmacy.¹⁶

Prior to the industrial revolution in Britain, the Church and the Army and Navy existed as important professions for the younger sons of the landed gentry. Apart from these, there were the three 'liberal' professions - divinity, physics and law. The essential qualification for entry into any of these three occupations, also called the learned professions, was a liberal education: that is,

"the education of a gentleman, not of a trader or an artisan".¹⁷

The mother of these professions continued to be the Church.¹⁸

The Church dominated the universities and the endowed schools, and the normal route to fellowships and professorships lay through holy orders. Divinity, Physics and Law formed the nucleus about which the professional class of the nineteenth century was to form. In India, the medical profession can be seen as a branch of the Army as it was the Army medical services which held sway over the medical profession, the employment of its practitioners and the regulation of services for military welfare.

The nineteenth century saw the rapid growth in numbers, skill and organization of the professions based on technology. Important developments such as qualification by training tested by examination were fundamental to these developing professions. The professions gradually began to organize themselves to sell qualified services; the market for these was dependent on the landed aristocracy and the business class. The professions of medicine and engineering dominated the eighteenth and nineteenth century British society. They drew a line between the qualified and the unqualified; between the professionals and auxiliaries. It was the 1858 Medical Act which eventually organized the profession of medicine, unified it and gave it the monopoly so long enjoyed by the legal profession. It created the General Medical Council [hereafter, G.M.C.], and formed a register of practitioners who could engage in private practice.

Indigenous medicine in India incorporated new forms of medicine brought into India. For example, the introduction of Unani medicine with the Muslim invasion of India led to a peaceful co-existence of the Ayurveda and Unani facilitated by the former amalgamating with Unani. A similar situation was observed with the introduction of western medicine in India. There was a long period of uneasy co-existence which was unhampered until the end of the nineteenth century, when there were increased pressures towards amalgamation brought about by the rise in the number of 'unqualified' practitioners or 'quacks' who were practising medicine by what Leslie terms, 'eclectic' knowledge. Qualified practitioners of medicine in India sought to put an end to private practice by such people. In other words, they sought to extend the professional control. Practitioners of indigenous medicine viewed this as a threat to their system of medicine. Practitioners of the two forms of medicine attempted to regulate entry into the profession. There were renewed efforts at amalgamation between the two systems.

Professionalisation in India modelled on the developed countries was thus discernible by the 1920s. State attempts at sponsoring the profession of medicine in India, however, failed. Western medical doctors were faced with a situation of medical oligopoly when their indigenous counterparts became equally enthusiastic in legitimising the indigenous systems of medicine. Medical education - including entrance to Calcutta Medical College, establishment of new medical colleges and decision-making on

promotions—came under government control. This led to what Jeffery calls, 'deprofessionalisation' in that

"western medical doctors lost autonomy, both within and outside public employment, and have been vulnerable to political intrusions, still reamining powerful and prestigious".¹⁹

The conditions which gave rise to the growth of the medical profession in Britain were strikingly different from those in India over the same period. One factor of professionalisation in Britain was the legitimisation and regulation of a monopoly in medical practice sanctioned by the State. In the Indian context, however, opportunities for medical regulations were severely limited because of the competing traditional medical groups; the practice of medicine was thus never wholly, or even extensively, regulated by the State.

But the State did, in fact, control the medical service in the Army and in the civil medical agencies, that is, below the level of the I.M.S. The professional groups [the medical officers in Britain] were involved in this area. They attempted to regulate entry to practice, framed ethical codes in the profession, and were, at the same time, increasingly linked with regulating professional practice in colonial India. These attempts were facilitated by the outflow of professional migrants from Britain to the Indian empire, staffing the colonial bureaucracies. In the words of Johnson,

"the outflow of British professionals was complemented by an inflow of intending professionals from the colonies, seeking education".²⁰

The recruitment policies and regulation of medical practice in India followed the status quo as it operated in Britain; the registration remained the main criterion of qualification. Unfortunately, State sponsorship of medical profession in India could not be successful in the way it was in Britain. The areas of professionalisation in the two countries were not the same. While in Britain, State intervention was in terms of regulating private practice, in India, practitioners were in State employment.

In the discussion to follow, I shall argue that the Imperial State sponsored the development of a profession of medicine in 19th and 20th century Bengal, and that State attempts in this direction failed firstly because of the heterogenous nature of the medical profession at that time, and secondly because of the changing nature of the colonial State.

The history of the Imperial State and changes in the medical policies in India can be divided into three main periods.

- A. The period prior to 1860
- B. 1860 to 1920
- C. 1920 to 1947 (until independence).

A. Until the end of the 18th century, there was very little to distinguish the British Courts from the rest of India. The British had their own doctors serving at the courts, some of whom even joined the Mughal courts for a better career.²¹ The British State was "an amalgam of commercial, administrative and military machines".²²

The demise of the N.M.I. and the establishment of the Calcutta Medical College with its western dominated medical education represented the end of attempts at a peaceful amalgamation of indigenous and western medical education. The College started with 50 students as foundation students, between the age of 14 and 20 years; these were divided according to the stipend they received.²³ Proficiency in Bengali and Hindustani, with English in both cases, was considered essential. Of the 50 students admitted as foundation pupils, a majority [exact number not known] had had education in the Hindu College²⁴ which, though imparting liberal education, had medicine as one of its courses.

The Medical curriculum at the commencement of the session on 1 June 1835 consisted of a series of lectures on osteology delivered tri-weekly until the 30 September following. An extended course on Anatomy was introduced in the same year. Dissection continued to be looked upon with disfavour by the Hindus.

The year 1836 marked a turning point in Indian attitudes to the practice of dissection. For it was in this year that four²⁵ Indian youths who were

"bold enough to discountenance the prejudice" 26
volunteered to take to dissecting human corpses, and

"in the presence of all the Professors of the College and of other pupils, demonstrated with accuracy and nicety, several important parts of the body".²⁷

The four students who practised dissection apparently were amongst the 11 students who passed the first examination held on 30 October 1838. Concomitantly, they represented the first batch of medical men in Bengal trained in western medicine, declared competent to practise medicine and surgery. They also represented the first batch of Indian physicians appointed by the government as sub-Assistant Surgeons to the hospitals at Dacca, Murshidabad, Patna and Chittagong, at a monthly salary of Rupees 100.²⁸

The success of Indian students in western medicine, and more so in handling human corpses for purposes of dissection, drew the attention of Dr. Wise, the then Secretary to the General Committee of Public Instruction, who suggested that

"8 of these pupils be sent to Europe for further education".²⁹

One Dwarkanath Tagore, a former student of the late N.M.I. and later transferred to the Calcutta Medical College as a Professor, proceeding to Europe for the second time in 1845, offered to take two pupils to England. Bholanath Bose, Surya-kanth Chakraborty, Gopalchandra Seal and Dwarkanath Bose were amongst those who went to England on 8 March 1845. The expenses were met by private subscriptions; Professor Goodeve, it is recorded, raised a substantial sum by obtaining donations from local elites [prominent amongst whom was Nawab Nazim of Bengal] to defray their expenses.³⁰

Following the death of Mountford Joseph Bramley in 1837, the Committee of Public Instruction reorganised the professorial staff by abolishing the office of Principal,³¹ and for the first time, a non-medical man, called David Hare, was appointed as Secretary. The staff also was increased in February 1837 with appointments of more Professors in the fields of Surgery, Clinical Surgery, Botany, Clinical Medicine and Anatomy. With time, Chairs were added to the Medical College. The following rearrangements seem to have been made between 1841 and 1912.³²

1. Chemistry, separated from Materia Medica in March 1842
2. Ophthalmic Surgery, separated from Surgery, March 1842
3. Anatomy and Surgery, separated from Midwifery, Feb. 1850
4. Medical Jurisprudence instituted 1850
5. Descriptive and Surgical Anatomy, a lectureship since 1837, became a full Chair in 1855
6. Dentistry, instituted Aug. 1861

7. Hygiene, instituted Aug.1864
8. Zoology and Comparative Anatomy, separated from Anatomy, Jan.1869
9. Pathology, instituted Dec.1871
10. Clinical Surgery, instituted 1912.

In order to introduce a system of examinations and scholarships, the Bengal government replaced the Committee of Public Instruction by a Council of Education in the year 1842.

The curriculum was developed and examinations instituted and modified with a view to recognition of the training given by the College, by the British Medical institutions. Initially, the British authorities argued that there was insufficient teaching in each subject and that each Professor was attempting to cover too wide a range. Eventually, to meet these conditions of recognition, the College instituted a minimum of 70 lectures and demonstrations on each subject, and assigned Professors no more than one branch of study. The changes required extending the period of study from four to five years - a reform which was not carried out in Britain until forty-five years later.³³

The new curriculum was framed in consultation with the Royal College of Surgeons in London in 1844, and was recognised by them, by the University of London and by the Society of Apothecaries in 1846.³⁴

Alongside its work on full medical education in accordance with western medical practice, the College was used to provide training for subordinate Indian medical personnel. The requisite supply of these had ceased since the abolition of the N.M.I. in 1835. But the demand for their services continued, especially in the Native Regiments where it became very urgent.³⁵ Thus in order to

"educate native doctors for employment in the Army and Civil Stations",³⁶

the government resolved, upon a recommendation of the Education Committee, to make use of the Medical College for instructing the indigenous population. The want of native doctors had become critical by the year 1838. This was met by the institution, in 1838-39, of an additional class at the Medical College. The class, founded by Government Order of August 1839, was a revival of the teaching in vernaculars which had been in abeyance from 1835 to 1839.³⁷

Medical instructions at the new class were carried out in Anatomy, Materia Medica, Medicine and Surgery, in the medium of Urdu and Hindustani. 50 students were selected at the start of the session in 1839; all of them were admitted on a monthly allowance of Rupees 5 each. Dissections and teaching methods followed European principles. As for clinical training, the students were employed at the same time on practical hospital duties at the Medical College Hospital.³⁸ The hospital was founded in 1838 by the College

Council with a view to imparting effective instructions on the theory and practical aspects of medical science. And the salary saved from the abolition of lectureship in Clinical Medicine, which followed one McCosh's resignation,³⁹ was devoted to the maintenance of the hospital ward.

The Military or Hindustani class was thrown open, apparently since its inception, to all Indians desirous of acquiring medical knowledge but liable to enter the terms of service thereafter. The number of pupils for admission was, however, restricted to 150, and successful students were expected to pass an examination before the Professors of the Medical College before they could enter the service as Native Doctors.⁴⁰ Another restriction imposed on the native doctors was that those attached to Civil Stations were liable to serve with the Army when so directed in General Orders of the government; the same condition applied to them when serving as native doctors attached to Corps.

There were two aspects of the course of instruction followed in the Military class of the Medical College. These were called theoretical and practical, respectively. The former occupied the first two years and the latter the third year; theory included study of Anatomy with an outline of the functions of organs and dissections, Materia Medica and Practical Pharmacy.⁴¹ At the end of second year of theoretical study, courses on medicine and surgery also were included. It was in the third year of the course

that instructions on the practical duties of a Dresser, Dispenser and a Compounder were imparted. These were carried out in the hospitals where Indian students obtained practical knowledge from Indian teachers of medicine and surgery; post-mortem examinations formed a part of the clinical instructions at the hospitals. And at the end of three years, thus, Indian students of the Military Class could perform all the duties of Dressers and Compounders, administering medicines, as also general hospital assistants. The exact career of these native Doctors is not known.

As the century progressed, the want for native doctors in Bengal became more urgent, especially amongst the civilian population. The outbreak of Cholera in previous years, perhaps, added to this need. And in order to meet this demand, the State added to the Medical College, another class of native doctors in the year 1851. Qualified students were employed in the subordinate medical service to serve the indigenous population.

The new class was called the Vernacular or Bengali class, which involved a two-year apprentice training. 21 students admitted at the start of the session were examined for the first time in 1853.⁴² Qualified students of this class of native doctors were called Hospital Apprentices or Vernacular Licentiates in Medicine and Surgery [V.L.M.S.]. A knowledge of Bengali was an essential pre-requisite for admission to the class. The course of study and practical instructions followed were much the same as those followed

in the Hindustani class. And also, at the end of the three-year course, successful candidates were conferred with a diploma testifying to their being qualified for holding public employment as native doctors; they were placed under Deputy Magistrates attached to Charitable Dispensaries and Jail Hospitals. Some of them, we are told, were even employed as Vaccinators.⁴³ These were employed to look after cases of cholera prevalent in Bengal at that time. Some were employed in the Stations and Hospitals in the Bengal Presidency as well as in the extended colonial territories.⁴⁴

While additional medical classes were being established in order to provide recruits for the Army and the indigenous population, further changes were brought about at the Calcutta Medical College, according to the needs of the State. In 1856, the details of expenditure and management of the College were transferred from the College Council and the Secretary to the Principal assisted by a new Council of Professors; the latter became the physicians and surgeons of the Calcutta Medical School.⁴⁵

An important phase in the State control of medical training since the establishment of the Calcutta University in 1857, was the management of the medical curriculum and examinations by the University and autonomous Examining Boards; these came directly under the State.

The 1857 Mutiny had set in changes in the social structure and government affairs. The causes of the Mutiny [Sepoy Mutiny] were manifold. The annexationist policy of Dalhousie, which brought about the liquidation of a number of Indian feudal states, the new land revenue system which exposed, by its heavy pressure, the mass of the Indian peasantry to acute economic pressure, as well as the replacement of Indian handicrafts industry by the influx of machine-made goods of the British industries in the Indian market, all contributed to the great revolt. The 1858 Government of India Act set in further changes. It entailed reporting and maintaining financial accounts of the government, and also promotion of 'moral and material progress' of the country. Involvement of Indians in different levels of the new government also constituted a vital aim of the policy.

The major changes, thus, stem from about the second half of the 19th century when the Crown took over from the Company in 1858. The period was also marked by the State's decision to extend the benefits of western enlightenment [and the newly-created profession of medicine in Britain] to the population of India.⁴⁶ There were, however, severe limits to these changes. For the prime concern of the Imperial State still lay in the maintenance of law and order and of land revenue.

Two changes followed as a result of the policy of the Imperial government - one was the provision of medical services and the other

was the spread of European doctors to look after the health of the European Civil Officers into the mofussil. By the 1840s and 1850s, the I.M.S. [the medical services which was mainly a military service until 1947] had well-educated medical graduates with

"more fixed and determined views of the superiority of western techniques". 47

These men were entrants in the 1840s and 1850s and were dominant in the 1860s and 1870s. This generation of doctors, according to Hume, was responsible for the stopping of the scheme operated by the Punjab government, using hakims as vaccinators and health extension workers from the 1860s up to the 1880s.⁴⁸

The consolidation of the British empire led to an expansion of administrative services. The colonial administration thus formed the main source of demand for western medical services. Prior to this expansion, western doctors were attached to companies trading throughout the Empire. The early 19th century had seen the development of medical missionary work, along with the permanent medical cadres in the late nineteenth century; however, there were still large numbers of Church hospitals and medical missionaries in the 1930s.

In the years following the establishment of the Calcutta Medical College, the Ayurveda flourished with the efforts of eminent kavirages such as Gangadhara Ray and Gangaprasad Sen. The period

was marked by the pre-eminence of an illustrious generation of Kavirages, as shownⁱⁿ Charts I & II .

I - Students of Gangadhara Ray, 1789-1885, and their Leading Students.⁴⁹

<u>Gangadhara's students</u>	<u>Second generation</u>	<u>Third generation</u>
Dwarkanath Sen	Jogindranath Sen Umacharan Bhattacharya Rajendranarayan Sen Kunjulal Visnagrata Laksmiram Sharma of Jaipur Gobordhan Sharma of Nagpur	
Gayanath Sen	Sitanath Sen Ramanath Sen Satyanarain Shastri of Benares Dharmadas Gupta of Benares Tryamvaka Sastri of Benares Shyamadas Vacaspati	Bilananda Tarkatirtha Ramchandra Mallick Vijoykali Bhattacharya Naliniranjan Sen
Haranchandra Chakraborty	Jyotish Chandra Saraswati Rameshchandra Chakraborti Prabhakar Chatterjee	
Sreecharan Sen		

II - The Students of Gangaprasad Sen, 1824-1896, and their Leading Students.⁵⁰

<u>Gangaprasad's Students</u>	<u>Second generation</u>
Nishinakta Sen Bijoy Ratna Sen	Jaminibhusan Ray Virajacharan Gupta Durgadas Bhatta
Ramchandra Vidyabinod	

Translation work continued in this period too. Bijoyratha Sen, for instance, for the first time translated one of the Ayurvedic texts, Astangradhya of Vagbhata into Bengali with accompanying introductions and suggestions for the revival of the Ayurveda. Sen's achievement was recognised in the form of the

honorary title Mahamahopadhyaya, conferred on him by the ruling princes.⁵¹ He also advocated the cooperation between western and Indian medicine. His idea found expression in later years when Jaminibhusan Ray, one of his students, founded the Ayurvedic college where the two forms of medicine were studied simultaneously.

B. The period of most change in the profession of medicine as well as the State commences towards the end of the 19th century. The rise of an English-speaking class of Indians, who formed the backbone of the nationalist movement, of increasingly successful traders, of large landowners, and of new industrialists, all contributed to this change. The period of 1860-1920 also witnessed the development of both indigenous and western practitioners towards a professional model.

Two important medical issues emerged as a consequence of the changes in the nature of the State [these apply to Bengal too]. These could be seen in the policy disputes at the time - the issue of encouraging an independent medical profession and, if so, how; and how medical services could be effectively extended to the entire Indian population. Whereas they were restrictive in their attitude towards indigenous medicine in government services, they were tolerant towards it in the delivery of medical services to the general population. After 1857, the State had a greater responsibility of the general population, but apparently had an inadequate medical personnel in proportion to the vast population.

And in order to meet the increasing medical demands, the State sought to utilise the extant indigenous forms of medicine.

Available evidence suggests that in Punjab, the provincial government employed hakeems and vaidas for extension of medical services in different regions and that the Lahore Medical College taught these practitioners the principles of ^{the} Ayurveda and Unani from 1887 to 1898.⁵² The reason for the tolerance was that before the end of the 19th century, there were very few practitioners who had been fully trained in State medical schools and colleges. And in order to reach the rest of the population, which the State's services failed to cater for, indigenous practitioners were included in such schemes of extension of medical relief. The graduates of Calcutta Medical College, and also those of Bombay, Madras and Lahore, found easy employment in the growing State bureaucracy - in the army, jails and railways. The 1872 Census of Bengal lists 3,769 physicians, surgeons and doctors, but over 23,700 vaidas and hakeems.

The revised orders of the government in 1864 also divided the Bengali class into the Native Apothecary and the Vernacular Licentiate branches which may have led to an increase in the number of medical men practising independent medical profession; the former was intended to train more students for government employ, while the latter educated them in minor medicine and surgery

aspects in order to

"fit the students for independent practice among the poorer classes of their countrymen".⁵³

The vernacular licentiate class commenced the first session in 1866-7, and included courses on the diseases of women and children, midwifery and medical jurisprudence. Medicine in India was further raised in status by the conversion of 'classes' into independent medical schools to be placed under definite rules and regulations. Thus in 1873, the native Apothecary Class and the Vernacular Licentiate Class of the Bengali Department were transferred to a new school, as a result of the great influx of students into the class. The school, called the Sealdah Medical School or Campbell Medical School, had 823 students at the start of the session.⁵⁴ In the same year, the Hindustani class was converted into the Temple Medical School. The chief object of the schools, placed under a distinct Superintendent, was, as records have it,

"to educate doctors who wished to settle in rural areas, to take the place then occupied by vaidis and hakeems and to extend to the community as far as possible the benefits of a European medical training".⁵⁵

This was stated in the resolution of the Education Department in the year 1879. [Appendix **V** shows the various stages in the growth of the Calcutta Medical College].

The establishment of the two schools led to a clear distinction between a Medical School and a College; the former represented a teaching institution granting diplomas or certificates to qualified students to fill up subordinate posts in the services of the government, and the latter conferring degrees after a recognised period of study.⁵⁶

The State continued to employ native doctors until 1891 when it introduced the system of bonding students for recruitment to government service.⁵⁷ The restriction may have been imposed in order to get more recruits for the Army. For Indian doctors from the Bengali Class, besides entering government service, could take up independent practice among the poorer classes of the Presidency.⁵⁸

Though courses on practical chemistry and additional lectures were introduced by the Calcutta University Senate, following the affiliation of the Medical College in 1857, it was not until later years that knowledge of preliminary subjects such as Chemistry, Botany, Physics and Zoology was taken as an essential pre-requisite to declaring a medical student as qualified to practise. University examinations for the above course were then held, for the first time, jointly by college Professors and external examiners in 1901-02.⁵⁹ Study of Anatomy and Physiology for a minimum period of two years and of practical work in medicine and surgery in a recognised hospital also added to the essential qualifications prior to conferring the medical degree. Increasing importance of anatomy

and surgery were a result of the anatomical and surgical developments and handling these cases for purposes of treatment.

Further attempts were made to improve the standard of medical education in the medical schools established in various parts of the Presidency. The course of study, for instance, was extended from three years to four in 1896, and the entrance qualification was gradually raised until in 1904, it was raised to matriculation. And finally, the schools were transformed from vernacular to English institutions. About a decade later, the State formed the State Medical Faculty of Bengal for examining students of these schools for purposes of recognition by the Bengal Council of Medical Registration;⁶⁰ passed students of medical schools, who entered government service, were conferred with the title of sub-Assistant Surgeon.

Once medical education came with State politics, it seemed an easy task for the State to reorganise the medical curriculum at the Calcutta Medical College. This the government did by passing the Indian Universities Act in the year 1904 empowering the universities to revise the medical curriculum. Thus, Lord Curzon's Indian Universities Act of 1904 reasserted government influences in that

"the government could not only approve but also add to or alter the body of regulations which the universities were required to submit".⁶¹

The government, thus, not only founded universities but also maintained a strong voice in their administration as well as in the standards of training.⁶² A similar pattern of control was followed by medical colleges in Madras, Bombay and Punjab where again examinations were held under the guidance of the University authorities. While on the one hand, universities coordinated teaching in colleges, Examination Boards on the other, took charge of regulating medical schools. Medical education, then, until 1894, was under the Director of Public Instruction as there was no Health Ministry in the government until the early twentieth century.

The great kavirages, as listed in Charts I and II, practised in Bengal, some extending their influence outside Bengal, practising in Benares, Hardwar and other distant cities. These practitioners were known for their efforts in resuscitating the indigenous forms of medicine. In 1878, Chandrakishore Sen, a kaviraja of the traditional Srikhanda School, [Chart I] and a junior contemporary of Gangadhara Ray, opened a dispensary in Calcutta with the idea of selling prepared medicines at a cheap rate. And in 1898, success in this direction led him to undertake large-scale production by shifting the dispensary to Kalutola. In addition, he published inexpensive books to propagate the knowledge of the Ayurveda and to highlight its scientific essentials. Ray was inspired to undertake large-scale production by the pharmaceutical concern founded in 1884, in order to manufacture and sell Ayurvedic drugs; the Company was called N.N. Sen & Co. Private Limited, Calcutta. Similar

efforts were made to commercialise Ayurvedic drugs. And in 1901, the success of Sakti Ausadhalaya of Dacca was followed by other famous pharmaceutical industries, Sadhana Ausadhalaya and Kalpataru Ayurvedic Works.

The strength of the indigenous medical groups in Bengal had become apparent by the 1880s. This was, however, paralleled by an increase in the number of western medical practitioners. Of the latter, some were trained in western medicine at the Calcutta Medical School founded in 1886. This was the first non-official school managed and staffed entirely by Indians.⁶³ In 1905, differences arose between the supporters of the school. Who these people were and what causes led to the dispute is not known to us. All that is recorded is that some of them split up and founded other institutions so that by the end of 1907, there were three non-official schools of western medicine in Calcutta. Some of them were commonly styled 'diploma shops' in that students could obtain a medical diploma by paying the required fees.⁶⁴ The diploma, however, did not connote a degree of training as that possessed by men educated in recognised medical institutions. Faced with this situation, the Calcutta Medical Society, supported by western medical men, proposed the registration of medical practitioners in Calcutta. The government, however, dropped plans to introduce medical registration at this time on the grounds that they were not strong enough to combat expected hostility from the vaidas and hakeems.⁶⁵

By the end of the 19th century, thus, hostility to indigenous medicine within the medical bureaucracy also had become apparent. The officers of the I.M.S. had become conscious of their claims to scientific legitimation. The substantial number of Indian medical graduates and licence holders posed a threat to the indigenous healers practising in the major towns; the growth of the traders, coupled with agricultural prosperity during the period provided more financial opportunities for both groups.⁶⁶

Just as the revival of the Ayurveda in British India was supported by Ayurvedic practitioners and nationalists, Unani medicine, too, was backed by its physicians in the last half of the nineteenth and early decades of this century. Prominent amongst these was Hakim Ajmal Khan⁶⁷ [1863-1928] who began the formal institutionalization of indigenous medical teaching and of its content. Hakim Ajmal Khan's major contribution was in

"making Unani medicine [also called Unani-tibb] part of the repertoire of Muslim [and later nationalist] political symbols".⁶⁸

Again, the strategies for reform of Unani medicine were based on the model of western medicine. Creation of formal schools with paid staff and fixed requirements attempted to replace the personalised didactic settings of family homes and apprenticeship. The movement for revival of Unani medicine was a part of the wider movement for

medical reform, including Ayurvedic medicine . The movement became more intense at the height of the national movement in India.

The major assault on indigenous systems of medicine was indicated by the attempts made by British and Indian physicians of western medicine to secure Registration Acts in each province

"so that no doctor of indigenous medicine could be legally recognized to give testimony in legal disputes, to certify illness for workers, or to perform any other legally required function".⁶⁹

The issue of developing an independent medical profession was reopened in 1907 when the government took steps towards assisting development in this direction by making provision for the registration of medical practitioners qualified to practice according to western methods.⁷⁰

The government proposed to assist the development in the following ways⁷¹ -

a] "by providing, as they do at present, so far as may be necessary, Government colleges and schools for the instruction of qualified practitioners",

b] "by throwing open, as has already been agreed to by the Government of Bengal, the appointments of house physician and house surgeon in the large Presidency Government hospitals to the best

students of each year, whether or not they propose to enter Government service",

c] "by encouraging the establishment of medical colleges and schools affiliated to the Universities or to Government medical schools, but conducted by independent medical practitioners". Steps to this effect were taken in Calcutta and Bombay.

d] "by demonstrating, as they do at present, and as they should do in an ever-increasing measure in the future, both through the agency of their own offices and through that of the various local authorities, the advantages of Western methods in hospitals and dispensaries",

e] "by associating private practitioners with the staff of Government hospitals, as honorary physicians and surgeons, and by allowing them facilities for consultations at Government hospitals and the use of the operating theatre, as has already been done in some instances in Bombay, the United Provinces and the Central Provinces".

Government efforts in assisting the development of an independent medical profession by making provisions for the registration of medical practitioners qualified to practice according to western methods were restricted. The difficulties connected with the subject were great, owing to the fact that the Indian population still formed a willing clientele to indigenous medicine. Consequently, registration acts provoked opposition. The government thus thought it worthwhile to wait until

western practitioners became considerable both in research and influence. Local governments framed their own regulations about fostering the growth of an independent medical profession. The government of Bengal, for instance, wrote,

"once an officer has accepted an appointment under government, he necessarily ceases to be independent, and the work which he undertakes on behalf of the government will occupy the greater portion of his time; that is to say, he will be a government servant first and only secondarily a private practitioner".⁷²

The development of an independent medical profession in India, thus, was a formidable task for the government as it involved changes in the government service [the I.M.S.], not in the private practice alone. Measures to reform the service, however, failed.

The early 20th century saw a decisive shift in the pattern of events. Political conflicts ensued over medical issues as the rising nationalist movement embraced the revivalism of Indian science as a part of the struggle for independence. Medical Registration Acts passed between 1912 and 1919 provoked a reaction from indigenous medical groups. Increasing hostility between western and indigenous physicians was clearly expressed at this time. The Bengal Medical Act of 1914 established a Medical Council and a Medical Register for the province of Bengal. Similar Acts in Bombay and Madras followed suit. The effects of these Acts on the

indigenous medical systems were seen thus:

The names of Dr. Krishna Swami Iyer of Madras and Dr. P.P. Vaid of Bombay [both trained in western medicine] were removed from the Provincial Medical Registers, in 1915, for their association with indigenous medicine.⁷³ Dr. Iyer was threatened by the Council with the perpetual removal of his name if he continued the management of Calavala Cunnum Chetiars Free Dispensary at Triplicane. Similar warnings were given to Dr. Vaid of Bombay who was threatened with expulsion. Dr. Vaid held the office of the Ayurvedic College, called Popat Prabhuram College, founded in memory of his revered father.

The Indian newspapers as well as indigenous practitioners in Bengal, and in other parts of India, condemned the Council's policy. The Dainik Bharat Mitra⁷⁴ remarked the action of the Madras Council as "highly unsatisfactory and hostile". The Sanjivani⁷⁵ and Hitavadi⁷⁶ expressed the action as "totally appalling" and degrading for indigenous medicine.

Recognition of medical schools and colleges was another way by which the Imperial State sought to legitimise the status of western medicine to protect the interests of the western medical community. The Government of Bengal, in 1916, recognized the Calcutta Medical School [founded in 1886] for the purpose of the schedule to the Act in order that holders of certificates granted by the school may be

entitled to registration.⁷⁷ The Indian Medical [Bogus Degrees] Act of 1916, however, put an end to the large turn-out of students from private institutions. The Act deprived all privately-managed institutions, such as the Belgatchia [also called the College of Physicians and Surgeons started in 1897-98], the power of granting diplomas. In Calcutta alone, Rai Kailas Chandra Bose, an officer in the I.M.S., reported the existence of four such institutions,⁷⁸ each capable of turning out a large number of what Bose termed 'bogus' doctors who were practising the healing art in several parts of India.

Various opinions on the suitability of the provisions made in the Bill were put forth before the Bill actually became the Act in 1916. Some⁷⁹ opined that the Bill should not be confined to western medicine and should include Homoeopathy, Ayurveda and Unani too. Even within the different levels of Imperial government, there were differing views. Some wanted to integrate indigenous and western techniques as a way of raising their standards, others were willing to widen the gap between western and indigenous medicine.

The 1918-19 reforms of Montagu [Secretary of State] and Chelmsford [Viceroy] marked another change in the nature of the State and the issues of medicine in colonial India. The reforms attempted to extend the political power and autonomy to local governments, thus establishing two forms of government control - central and provincial [also called the system of dual control

or Dyarchy]. They also created the category of 'transferred' and 'reserved' subjects; the former was placed under the elected Indian ministers intended to be responsible to an elected legislature. Education and Public Health fell in this category. 'Reserved' category included issues of finance, land revenue, police and others which were under official control of the central authority. The inter-War period thus saw a remarkable growth in the Indian membership of the bureaucratic services - those for the first time held by Indian ministers. Following this, medical services became a 'transferred' subject in the wake of which there was a rapid Indianization of medical services.⁸⁰ The 1912 Royal Commission of India, also had provided greater opportunities for employment of Indians in the Public Services of the country.⁸¹

C. As the Montagu-Chelmsford Reforms became established, Indian ministers got better chances to disburse patronage. Rapid Indianization, transfer of power to elected ministers and decentralisation of central power, were all changes of significance for medicine in India. Fearing that the ministers might introduce indigenous systems of medicine into the western medical courses, the State kept the regulation of medical standards from them.⁸² The intervention of the G.M.C., however, checked the intake of medical students by imposing restrictions on the standards of medical education in India. The 1886 Medical Act in Britain had prescribed midwifery and examinations in medicine and surgery. This had led to the extension of the period of study and more rigorous examinations.

In 1892, the G.M.C. had recognized the degrees awarded by the Indian universities.

Initially, the G.M.C. did not insist on inspecting the medical colleges in India, believing that the standard of medical education in Indian colleges was akin to that in Britain, and whatever minor alterations they suggested were readily followed by the university authorities.⁸³ The situation did not last long. The G.M.C. in 1907 emphasized training in midwifery in order to raise their standards; the increasing infant mortality rate in Bengal at that time added to the emphasis.

Inspection of Indian hospitals by the G.M.C. brought the issue of lack of midwifery training to the fore. The case of Calcutta affords an interesting account of the conflicting nature of the University authorities and the G.M.C.

Up until 1922, the G.M.C. did not impose restrictions on recognition of medical degrees of Calcutta University. The extension for recognition was granted until 1924 subject to receipt of satisfactory report from R.A. Needham. Needham was appointed as the Inspector-General of medical education to inspect the final examination of the Indian universities. The 1922 and 1923 reports of medical training in midwifery, however, did not meet with the approval of Needham. The 1924 report again revealed a similar state of courses which Needham stated thus:

"the number of labour cases available for students for efficient teaching of midwifery was too few".⁸⁴

The 1924 report caused controversy with the Calcutta University. The University refused Needham permission to attend and inspect their medical examinations for its authorities believed that their students possessed the requisite knowledge and skill for the efficient practice of medicine and surgery, as also midwifery. Calcutta degrees were eventually derecognised by the G.M.C. from December 1924. In July 1927, the issue was reopened and the G.M.C. recommended the appointment of an Inspector of Medical Qualifications to carry on the work of inspection. A year later the G.M.C. accepted the other alternative to this - that is, the creation of a full Medical Council of India [hereafter. M.C.I.]. The government of India could foresee problems associated with the M.C.I., as by this time, provincial governments had begun to raise the argument that a Central Council would be a threat to provincial autonomy. A conference of Provincial Health Ministers endorsed this objection.⁸⁵ The controversy eventually led the G.M.C. to derecognise all Indian medical degrees from February 1930, on the argument that

"the mere possession of an Indian medical degree does not, by itself, ensure the possession of a qualification equivalent to the minimum qualification accepted in this country".⁸⁶

An Act was eventually passed in 1933, thus establishing an All India Medical Council to regulate medical degrees and their standards and to continue international recognition. Indian degrees were recognized again from 1936 after the Government of India Act. The scheme of reciprocity of recognition of medical degrees between Britain and India was the decision.

While western medical authorities were preoccupied with altering medical courses and framing new ones for a professional model in Bengal [and in the rest of India], their indigenous counterparts desired to have an independent status in the profession of medicine. They got the first fillip from the 'Swadeshi' or Nationalist movement in the early decades of the 20th century. Advocates of the Non-Cooperation movement prevented the sick and poor from attending western medical hospitals and instead advocated indigenous methods of treatment.⁸⁷ The Medical Registration Acts of 1912 and 1914 invoked a strong response and an increased pressure on the government by the nationalist movement. Even though the Acts did not intend to include the Indian systems of medicine, registered practitioners only were allowed to enter government medical services and could work in government medical facilities.

The Ayurvedic movement has, however, been one of major significance in Indian history; it aimed at achieving recognition and status by seeking State patronage and establishing institutions. Independent bodies were nominated by the State to take charge of

Ayurvedic and Unani practitioners - the British Indian Association took the onus of listing vaidas, while the hakeems were taken care of by the Mahomedan Literary Society and the National Mahomedan Association in Bengal. This may have been done under the tensions owing to nationalist pressure on the Imperial government.⁸⁸

The Ayurvedic movement asserted itself in the beginning of the 20th century and was only successful in establishing a parallel set of institutions devoted to indigenous and western methods throughout India. The movement found considerable expression in 1907 with the establishment of a professional group of indigenous practitioners, known as the All India Ayurvedic Congress which formed the leading organisation of vaidas in India.

Political justice, legitimacy and support by the government were the main areas of concern for the Ayurvedic movement. Brass sees this aspect of the movement as

"an educational interest group which has attempted to acquire legitimacy and professional status through political methods".⁸⁹

The process of focusing on a political solution to the professional status of Ayurveda, however, failed to bring encomiums to indigenous medicine. The movement failed to create the infrastructure which could have allowed Ayurvedas to compete with its western medical counterpart. No uniform courses of training and

professional standards of education and practice were created. Brass has described in some detail the reasons for the failure of the Ayurvedic revivalist movement. Internal conflicts among the proponents of Ayurveda over the method of reviving was the main cause. While some favoured promotion of "shudda" or "pure" Ayurveda to favour reliance on ancient texts, others advocated integration of indigenous and western methods. Objections of advocates of an integrated course were based on their recognition that the "pure" form could not deal with the public health needs of India and in order to fill this gap, western medicine should be incorporated. But we know from our chapter on Indigenous Drugs [Chapter III] that even western practitioners have utilised indigenous drugs during the cholera epidemic in India. Profound disagreement on the content of the curriculum, and hence on the qualifications essential for professional status continued to exist.

From the time of World War I and the 1919 reforms the revival of Ayurveda was increasingly linked with nationalist politics. The development of an Ayurvedic College at Poona may well illustrate the politicization of medical revival in the post-War period during which there were increasing problems of student unrest in Ayurvedic Colleges. The Civil-Disobedience or Non-Cooperation Movement prodded students to boycott government schools and all foreign goods. In response to this, they began to boycott universities throughout India, as a part of the Campaign. At Poona, political leaders founded the Lokamanya Tilak University [after the nationalist hero

Lokamanya Tilak] and introduced^{the} Ayurveda as one of the courses of study. In 1932, however, the institution was derecognised and students of the university were imprisoned for participating in the Second Civil-Disobedience Campaign of 1930-34. In response to this, the Ayurvedic nationalists founded another college of Ayurveda in 1933 at Poona.⁹⁰ which finally gained State recognition after independence.

In addition, in 1921 there was established a national university of Bengal, Gaudiya Sarvavidyayatana, as part of the Non-Cooperation movement. An Ayurvedic medical wing was established in this university. More colleges of^{the} Ayurveda began to flourish with the support of reputed Ayurvedic physicians; Kaviraja Shyamadas figures as an important contributor to this development. The Gobinda Sundari Ayurvedic College, started in 1922 by Kaviraja Ramschandra Mallick with the patronage of the Maharaja of Cosimbazar, and the Viswanatha Ayurveda Mahavidyalaya founded in 1932, shared the common base of foundation - that of

"restoring Ayurveda to a fully scientific basis by educating physicians trained in all branches of medicine".⁹¹

Parallel instructions in Ayurveda and western medicine were carried out in all these institutions.

In Bengal, by 1916, the newspapers were demanding that the government encourage the Indian systems of medicine, and that

"it is the clear duty of the government in this country to endeavour to resuscitate the Ayurvedic and Unani systems and bring them into conformity with modern principles of the investigation and cure of human ailments".⁹²

In 1917 for the first time, one of the provincial governments, Madras, showed concern for Ayurveda and appointed Dr. Koman to investigate into the state of indigenous medical systems.⁹³

Steinthal reports the Madras government's decision as influenced by political pressure from the Ayurvedic proponents.

Thus the increasing strength of the nationalist movement put pressure on the provincial governments to react to demands for encouraging, or at least inquiring into the efficacy of indigenous medical systems. The responsibility became more intense after the 1919 Reforms when decentralization handed subjects of health to provincial ministers. Several provincial governments appointed committees to investigate into indigenous systems.

From the second decade of the 20th century, the decision on the profession of Indian medicine rested with each provincial medical department; policies, however, differed in individual areas. Each province had branches of the Ayurvedic Congress to present the needs and demands of indigenous practitioners before the provincial governments.⁹⁴ In 1931, indigenous medical men established a General Council and State Faculty of Ayurvedic medicine in Bengal,⁹⁵

for regulating the standard of instructions in Ayurvedic medicine, and also to grant certificates or diplomas to examined candidates of recognised Ayurvedic institutions. It may well be that a similar organization was formed for Unani medicine but no evidence survives. In provincial governments, thus, there was some hope of support for Indian medical systems. In other measures, such as the establishment of the M.C.I. in 1936, indigenous practitioners were excluded despite the protests of nationalists. This widened the gap between indigenous practitioners and their western counterparts when the latter were threatened by international derecognition if they associated themselves with a system described as

"simply mysterious, mythical, or quasi-religious memories clothed in allegory".⁹⁶

In sum, the Imperial State from 1900 was pushed into making decisions to control the diverse forms of medicine in India, directing medical practitioners and forms of medical education. It was partly in response to this form of State intervention that indigenous and western medical men organized themselves and made demands on the State for further recognition and support.⁹⁷

CONCLUSIONS

I started with the argument that the State in Bengal during British India sponsored the growth of the medical profession in India. In the foregoing account we have seen that in so doing, the State encountered other medical groups, each of which tried to legitimate their professional position, thus subverting the policy of the State. This suggests that State mediation in the growth of medical profession does not always lead to professionalization. The case of Bengal exemplifies this failure.

Our second conclusion is that State sponsorship of the medical profession in Bengal failed because of the changing nature of the British State in India. The post-War Reforms, coupled with the rising nationalist feelings added to conflicting situations so that in the end we had a case of professional 'oligopoly' and not monopoly. At the time of independence, there were four medical groups in the Indian situation, each catering to a different clientele. The first three had formal qualification. They were: students of the Medical College serving the rich and the elite and the Army, students of the medical school serving the British territory, and students of the medical school serving the indigenous population. Beyond these were the practitioners of indigenous medicine without formally recognised qualifications catering largely to the needs of the Indian population.

F O O T N O T E S, Chapter IV

1. T.J. Johnson, "Imperialism and the Professions" in P. Halmos (ed.), Professionalisation and Social Change, 1973, University of Keele, pp.281-309.
2. R. Jeffery, "Allopathic Medicine in India: A Case of Deprofessionalisation?", So.Sc. and Med., 1977, Vol.11, pp.561-573.
3. Major part of this argument has been obtained from Jeffery, *ibid.*
4. Others include P. Halmos, Talcott Parsons.
5. T.J. Johnson, Professions and Power, 1972, London, British Sociological Association.
6. See G. Gyarmati, 1975 in Jeffery, *op.cit.*
7. See Johnson in Jeffery, *ibid.*
8. See Friedson in Jeffery, *ibid.*
9. Jeffery, *ibid.*
10. T. Parsons, Essays in Sociological Theory, 1954, Illinois, Free Press, p.372.
11. See Parsons in Johnson, 1972, *op.cit.*
12. K. Prandy, A. Stewart and R.M. Blackburn, White Collar Unionism, 1983, London, Macmillan Press, p.6.
13. *Ibid.*
14. D.D. Knowles, "Religious Life and Organization" in A.L. Poole (ed.), Medieval England, 1958, Vol.II, Oxford. See also G. Millerson, The Qualifying Associations, 1964, London, Routledge and Kegan Paul.
15. Millerson, *ibid.*, p.16.
16. C.J.S. Thompson, The Mystery and Art of the Apothecary, 1929, pp.272-285. For details see also R. Lewis and A. Maude, Professional People, 1952, London, Phoenix House.
17. W.J. Reader, Professional Men, 1966, London, Weidenfield and Nicolson.
18. *Ibid.*
19. Jeffery, *op.cit.*, p.361.

20. Johnson, op.cit.
21. R. Jeffery, Health and the State in India, 1985, Ph.D. Thesis, University of Edinburgh. See also details on division into 3 periods.
22. Jeffery, 1985, op.cit., p.22.
23. Proceedings of the GOI, Home Dept., Medical Branch, Sept.-Oct. 1937.
24. Hundred Years of the University of Calcutta, Centenary Celebrations, 1957, Calcutta, D. Chakravarti.
25. These were Umacharan Set, Rajkrishna De, Dwarkanath Gupta and Nabin Chandra Mitra. See also Report of the General Committee of Public Instruction of the Presidency of Fort William in Bengal for the year 1839 - Late Principal Bramley's Report.
26. J.C. Bagal, "Early Years of the Calcutta Medical College" - Based on Educational Records", Mod.Rev., 1947, Vol.82, pp.210-215; p.211.
27. Ibid.
28. Sarbadhikari, op.cit., p.298.
29. These were from the first batch of 11 students who appeared at the examination. of these, 10 were Bengali and 1 was Christian.
30. Hundred Years, op.cit., p.36.
31. The office remained in abeyance for nearly 20 years and was revived in Feb.1856. See D.G. Crawford, Vol.II, p.439.
32. Ibid., p.440.
33. Centenary Volume, op.cit., p.25. See also India Public Consultations, 25 July - 10 Oct. 1846.
34. Eatwell, op.cit., p.16.
35. Report of the Committee of Public Instruction for the year 1839-40, Bengal. See also J.C. Bagal, "Early Years of the Calcutta Medical College" - Based on Educational Records", Mod.Rev., 1947, Vol.82, pp.210-215; p.211.
36. Report, 1839-40, op.cit.
37. Crawford, op.cit., p.441.
38. Sarbadhikari, op.cit., p.291.

39. No details on the reasons for McCosh's resignation.
40. Rules and Regulations of the Medical College in the Presidency of Bengal, 1860, Calcutta.
41. Hundred Years, op.cit. See also Report on Medical Education at the Vernacular Medical School, Sealdah by the Committee appointed to enquire into the Medical Expenditure in Bengal, 1879, Bengal.
42. Hundred Years, op.cit.
43. Rules and Regulations, 1860, op.cit.
44. Ibid.
45. Calcutta University Commission Report, 1917-19, Vol.III.
46. P. Woodruff, The Men Who Ruled India, 1954, London.
47. R. Jeffery, "Indian Medicine and the State", Bull.Br.Assocn. Orientalists, 1979-80, Vol. 11, pp.58-71; p.61.
48. J. Hume, "Rival Traditions: Western Medicine and Yunani-Tibb in the Punjab, 1849-1899", Bull.Hist.Med., 1977, Vol.51, pp.214-231.
49. Gupta in Leslie (ed.), op.cit., p.373.
50. Ibid.
51. Ibid.
52. Edn. Hlth. and Lands, July 1919, 26-51, N.A.I. See also Jeffery, 1985.
53. Calcutta University Report, op.cit. See also Report on Medical Education 1879, op.cit.
54. Calcutta University Report, ibid.
55. Report on Medical Education, 1879, op.cit.
56. The distinction never existed in England where the term 'medical school' was applied indiscriminately to all medical institutions.
57. Proceedings of the GOB, Municipal Dept., Medical Branch, Jan. 1911.
58. Report on Medical Education, 1879, op.cit.
59. Proceedings of the GOI, Home Dept., 11 Aug. 1906.
60. Calcutta University Report, op.cit.

61. S.H. Rudolph and L.I. Rudolph (eds.), Education and Politics in India, 1972, Cambridge, Harvard University Press, p.16.
62. Ibid.
63. Proceedings of the Bengal Municipal Department, Medical Branch, 1891. See also Proceedings of the Bengal Legislative Council, Jan. - Dec. 1918.
64. Proceedings, Jan. - Dec. 1918, *ibid.*
65. Jeffery, 1979-80, *op.cit.*
66. Ibid.
67. He was the scion of a family of physicians who had served at the Mughal courts, and after their decline, the courts of regional princes in India. See also B. Metcalf, "Nationalist Muslims in British India: The Case of Hakim Ajmal Khan", Mod.As.Stud., 1985, Vol.19, no.1, pp.1-28.
68. Ibid., p.4.
69. Ibid.
70. Parliamentary Papers, East India Company, 1914, Vol.LXiii.
71. East India (Medical) Company Correspondence, 1914, Vol.LXiiii, Cd. 7517.
72. Ibid.
73. Report of the All India Ayurvedic Conference and Exhibition held at Madras, 1916.
74. Dainik Bharat Mitra, 25-30 Nov.1915, Calcutta.
75. Sanjivani, 2 Dec. 1915, Calcutta.
76. Hitavadi, 2 Dec. 1915, Calcutta.
77. Proceedings, Jan.-Dec. 1918, *op.cit.*
78. Names not known. See Proceedings of the Government of Bengal. Local self-govt. dept., Med. Branch, Dec. 1915, 20-8.
79. Dr. M.N. Banerjee - qualified in England, Dr. Rai Kailas Chandra Bosc - Physician at Albert Victor Hospital in Calcutta.
80. Proceedings of the Conference of Provincial Representatives held at Simla, 24 - 30 June 1930.

81. For details see Indian Constitutional Reforms: The Montagu-Chelmsford Proposals - Report by the Secretary of State and the Viceroy, 1918. John Murra.
82. Jeffery, 1979-80, op.cit.
83. Proceedings, Simla, June 1930, op.cit.
84. Edn. Hlth. and Lands, Feb. 1925, 3-22A.
85. Edn. Hlth. and Lands, Sept. 1926, 26-31A. See also Proceedings, Simla, June 1930, op.cit.
86. See Legislative Assembly Debates, 1930 - cited by Jeffery, "Recognizing India's Doctors", 1979, op.cit.
87. P. Hehir, The Medical Profession in India, 1923, London, Oxford Medical Publication.
88. See also Calcutta University Commission Report, 1917, Vol.III.
89. P. Brass, "The Politics of Ayurvedic Education: A Case Study of Revivalism and Modernization in India" in S.H. Rudolph and L.I. Rudolph (eds.) Education and Politics in India, Oxford, Oxford University Press, pp.342-371, pp.342-3.
90. C. Leslie, "Modern India's Ancient Medicine", Transactions, 1969, pp.46-55.
91. Gupta in Leslie (ed.), op.cit., p.376.
92. Seventh All India Ayurvedic Congress, 1916, Madras, p.68.
93. See also B.J. Steinthal, The Ayurvedic Revivalist Movement in Early 20th Century British India, 1984, M.Sc. Thesis, Cambridge, Harvard University.
94. Report of the Health Survey and Planning Committee, 1962, Delhi, Vol.I.
95. Quinquennial List of Registered Ayurvedic Practitioners from 1352 to 1356 B.S..
96. Edn. Hlth. and Lands, Sept. 1926, 26-31A, N.A.I.
97. Jeffery, 1979-80, op.cit.

C H A P T E R V

PUBLIC HEALTH POLICY IN BENGAL

In Britain, the professionalisation of medicine was greatly advanced by successes in the area of public health. Before the major advances in drugs, public health policies had dramatic effects in the control and elimination of disease. There were attempts to introduce public health policies, which had been successful in Britain, into India, but successes were few and failures many. Public health policy was not an unambiguous source of prestige for western medicine. The first was the narrow scope of government objectives. The two most important issues of public health policy in colonial India were concern for the health of the Army and of the European population in India, and the protection of trade and commerce interests from being impaired by disease and epidemics.

Ramasubban¹ argues that health measures failed to reach the vast Indian population. Arnold, on the other hand, argues that they reached them but were nullified by religious barriers. The second reason, then, was the lack of sensitive policy towards the dominant social and religious conditions in India in order to tackle the health hazards. The third reason was the lack of government's ability to intervene directly in health conditions because of limited knowledge. This led to unfortunate consequences as public

health reforms for controlling cholera led to other health hazards, such as malaria.

Ramasubban² identifies the development of the public health system and of medical science in Britain as 'organic' and in India as 'non-organic'. In Britain, sanitary reforms controlled the major health hazards, establishing public health as an autonomous sector even before the major breakthroughs in medical science in the last two decades of the nineteenth century. In India, the development was not an organic one. It was shaped by external factors which included the theories of disease causation and sanitation developed in Britain and the priorities of the colonial government. Insofar as public health policies were carried out in India, they were, broadly speaking, an extension of health policies in Britain. In order to understand this, an outline of sanitary reforms in Britain is essential.

Trends in Medical Advances and Sanitary Reforms in Britain

In Britain, the field of bacteriology opened up a new link between the etiology of disease and its cure. Most essential to this development were the basic trends in related fields, such as pathology, during the early nineteenth century.

The older concept of the 'noxious miasms' in the surrounding air as the cause of disease, was broken down into 'miasms' in general. This came with the differentiation of specific forms of illness so that each miasm could be related to a given disease. Between 1800 and 1840, the growing interest in the activity of micro-organisms entailed work on the theory of a contagium vivum - that is, there must be a specific cause of specific disease.

This was aided by the invention of improved microscopes. The introduction of anaesthetics during the forties prevented much suffering but at the same time increased the mortality from infections, as most of the surgical procedures were still not free from puerperal infections due to lack of knowledge of fermentation activity of bacteria. Introduction of sterilization eventually made its way into the western medical world after much work by Joseph Lister in the 1860s. Surgical practice was performed with the introduction of antiseptic and aseptic procedures.

The example of Cholera in Britain illustrates the general change in the development of medical knowledge about the contagious diseases. Cholera did not reach Europe until the 1830s. When it first arrived in 1831-32 in Britain, it was subjected to the scrutiny of a rising medical community. The disease, however, remained a mystery in the 1830s. Theological imperatives seem to have dominated medical thought in the 1820s and 1830s in Europe. That cholera was sent by the Lord in punishment of sins, individual

and collective, was an almost unanimous belief prevalent throughout Western Europe,³ and also in America. Growing secularism, however, paralleled scientific progress, and by the 1860s the theological and moralistic explanations of the disease acquired a marginal theme. And thus in the 1860s was established the mode of transmission of the disease. The discovery in 1883 of the causative agent, by Robert Koch, ushered in a new era in the health of the European population, as for finding ways of combating the deadly disease.

The most rapid development of medical science dates from 1882-3⁴ with the discovery of pathogenic bacteria. Establishment of laboratories and institutes facilitated research in this direction. This helped in identifying pathogens for other infectious diseases. The cause of syphilis, for instance, was located in 1905, in the form of Spirochaeta pallide.

The development of medical bacteriology paralleled that of medical entomology which identified insects as the cause of several cutaneous infections. For malaria, however, even though the cause was known, there were no effective preventive measures. Not until 1879 was it shown by Ronald Ross that the mosquito was responsible for the transfer of the disease parasite. The parallel growth of entomology and bacteriology had implications for public health work in Britain which were sometimes different. Entomological discoveries indicated that a disease was not contagious while

bacteriologists attributed the spread of disease to transfer by contact; the two studies still calling for quarantine regulations for the prevention of the spread of disease.

With a knowledge of the period of incubation in a given disease, quarantine regulations subsequently came to be modified. Prolonged isolation of patients according to the duration of incubation period and the treatment within these confines was the result. Fumigation then formed an essential part of these regulations. And when the role of disease carriers - such as the mosquito in malaria - was discovered, fumigation was largely confined to mosquitoes, rats and lice, rather than bacteria.

The novel view of the relationship between 'filth' and 'disease' had two significant effects on the public health in Britain. One, it acted as the fundamental driving force stimulating the sanitary reformers of the early nineteenth century, and two, it brought about much of the legislation which eventually altered and improved health conditions in the industrial areas of Britain⁵ and Europe. These changes followed the works of Sir Edwin Chadwick⁶ [1800-90] and Thomas Southwood Smith [1788-1861], in the first half of the nineteenth century, both initiating the great movement for the prevention of disease.

Ideas of prevention of diseases prior to the nineteenth century were also influenced by the political economy of the time, for the

laws of economics which held the field at the time were given more importance in developing countries. The laws entailed

"buying materials and labour as cheaply as possible and selling the manufactured goods for as much profit as competition would allow".⁷

This was in tune with the laissez-faire policy of the time according to which people were left to themselves in order to improve their health and thus to work better for the material production of goods. Self-help and voluntary cooperation amongst the ailing population in Britain were seen by political economists to contribute to greater well-being. However, the great momentum in the direction of State interference towards health came after the works of Chadwick and Smith.

Appointment of Chadwick to inquire into the welfare conditions of the people exposed the extent of pauperism then prevalent in Britain. It was at this stage that Chadwick established the relationship between poverty, especially as seen in overcrowding and consequent lack of basic sanitary care, and disease which gave rise to the theory that disease was closely related to physical and social environment.

Prior to the mid-nineteenth century, the important part played by micro-organisms in the causation of infectious diseases was not known in any part of the world, though medical men believed that

"something" passed from the environment or from the sick person to cause the disease. This "something" in the air was called miasma which was said to arise from swamps and other natural sources contaminating the air. Until this time, even the mode of transmission of diseases like cholera, plague, influenza and others did not exist in the corpus of medical knowledge. Also, the idea of contamination of water and food, which was fully developed in later decades, was not stressed much until after the development of organised water supplies when outbreaks drew attention to water as a vehicle for transmission.

The outbreak of cholera in the year 1848 provided an opportunity to collect novel information on the mode of transmission which supported a new theory at the time. John Snow's [1813-58] work in the field established water as the transmitting agent in cholera epidemics, for he showed that the disease was common among those who took their water from the pump in London which was supposedly contaminated from nearby defective cesspits. At this stage, then, was established the mode of transmission of cholera without the knowledge of the exact causative agent.

The idea of "something" in the air as the causative agent of cholera shifted to that of "living organisms" when William Budd [1811-80], another English doctor, propounded that cholera was caused by a living, self-multiplying organism which breeds in the human intestine and is spread in water. Budd's theory that

"intestinal diseases" - like cholera, typhoid fever -
"are caused by living organisms within the intestine of the
patients, shed in the excretions and passed on to other
people if those excretions reach water or food",⁸

were eventually confirmed with the discovery of cholera organism
by Robert Koch in the year 1883; this was identified as Vibrio
Cholerae. Carl Eberth's [1835-1926] finding of typhoid bacillus
[Salmonella typhi] in tissues, and G. Gaffky's [1850-1928]
isolation of the bacteria in culture thereafter led to the
confirmation of etiology of cholera; bacteriological discoveries of
late nineteenth century by Pasteur, Wright, Von Behring and others,
added the idea of immunisation to the corpus of western medicine.
And once the cause of cholera was confirmed and established, medical
authorities sought to relate conditions of environment to occurrence
of cholera which ultimately brought about shifts in the nature of
provision of health conditions.

Several factors unite to give cholera special significance for
social history. The nature of the disease, its mode of transmission
and its links with unsanitary conditions and polluted water
supplies, offered one possibility - that cholera would claim its
greatest number of victims among the lower classes.⁹ It,
therefore, highlighted the social attitudes and the living
conditions of a broad segment of the population.

In England, as in other countries in Europe, social disturbances followed the cholera epidemic, and attitudes of the people toward the disease reflected conflicts in society. The 1831-32 epidemic left the medical men as well as the upper classes with the impression that slum areas formed a breeding ground of disease and social unrest; the approximate mean death rates were, for England 1.57 per thousand, for Ireland, 2.57, and for Scotland, 4.¹⁰ The epidemic struck at a time when the Reform Act of 1832 was passing through its final stages. Riots intensified at this stage. People protested against the economic and social injustice and frequently saw in the disease situation the most striking occasion of their protests. The class association of the disease worsened the chaotic situation at the time. A Royal Commission was, however, set up to find means of a cheaper system of relief. The occurrence of cholera thus fostered health and sanitation reforms and formed an important chapter in the history of public health, in Britain as well as in India.

Immunology was another related branch of medical science which influenced preventive measures in Britain. This involved vaccination against smallpox [using cowpox vaccine] as well as inoculation. The definite claims of good results were first made in 1845.¹¹ [This was made compulsory by the Vaccination Act of 1871]. Already, the Sanitary Act of 1866 had given local

authorities in Britain much greater power to abate nuisances and clean up the towns. After 1871, the whole country was divided into districts, each under the charge of a Vaccinator, a general practitioner under contract to vaccinate without fee. Jenner's introduction of vaccination stands as one of the most beneficial developments to the history of medicine. His discovery in 1880 of pathogenic micro-organisms and his successful production of a vaccine against rabies focused attention on the methods by which the body naturally protects itself against infection. From his work thus developed the protective vaccines and the antitoxins which could be successfully used in the treatment of developed disease.¹²

The sanitary reforms in Britain developed alongside the growth and expansion of towns. In the first half of the nineteenth century, the rate of increase in regard to both population and industrial output was greater than at any other time previously in history; as a result, stresses, strains, seldom experienced in the predominantly rural England of the earlier ages, began to show themselves. The increase was particularly associated with the unexampled rise in population in England. Some of the towns had multiplied in number several times over as the factories expanded, thus demanding more labour. According to the 1851 Census of Britain, the population of England and Wales had increased from 8,892,000 in 1801 to 17,927,000 in 1851. Also, the world population rose quickly from 750 million in 1750 to 1,200 million in 1850. The first half of the nineteenth century was, thus, a period of great

change in the growth of industries too. The history of public health in Britain, or any other country, is thus a history of such factors

"as social and industrial conditions besides the moral formal legal and administrative machinery set up by the State to conserve and improve the health of the individuals comprising the community".¹³

Thus in England, the move to introduce sanitary and public health reforms was initiated as early as nineteenth century when there was an unprecedented growth of major towns. The inefficient water supply and the breakdown of existing sanitary arrangements led to a rise in mortality rates peaked in 1831-2, 1848-9, 1854 and 1867 by the outbreaks of cholera. The first comprehensive Public Health Act of 1848 and the subsequent establishment of a General Board of Health ushered in a new step in public health policy in Britain. Local bodies were appointed to make public sewers and to provide drains to cleanse streets and fill up offensive ditches and to provide adequate supplies of water.¹⁴ The first Public Health Act in Britain was passed at a time when Britain was rapidly gaining wealth and influence largely because of the expanding industrial towns which entailed concern for the health of the industrial population.¹⁵ The Act established bye-laws prescribing minimum housing standards. The series of major enquiries - the Poor Law Commission of 1838 to study the causes of destitution in London, the Royal Commission of 1844 on the health of towns, and the Royal

Sanitary Commission of 1869, were involved in public health activities in England.¹⁶

Public health conditions in Britain were further improved by the Royal Commission on Housing in 1885 which led in 1890 to a Housing Act which apart from raising housing standards, gave local authorities power to recondition existing houses and to clear away slums. Legislation of working conditions in factories and shops helped in the improvement of the environment.

Given these facts, we shall now discuss how effectively were health policies in India framed by the colonial authorities in India.

Background of Health Policy in Bengal

Public health measures in Dacca, which was the capital of the Province of Bengal, Bihar and Orissa until 1716, afford an illustrative account of the government policies in this area. The British gained military control of Bengal in the year 1756-7, and in 1765 they assumed the civil administration of India. This was followed by an increase in British monopoly of trade and commerce as they had gained control over the whole country.

By the year 1810, the civil servants of the Company had responsibility of the growing urban city of Dacca. The first phase in the government policy towards municipal and health duties involved the appointment of local magistrates and collectors. These were not independent but were

"expected to report to the government through the proper channels their views on any question connected with the health and the convenience of the community".¹⁷

But this did not always mean that their ideas were implemented: it depended on the "availability of funds".¹⁸

Responsibility for the health and medical facilities of Dacca, then, lay with 'non-professional' or 'non-medical' men who were more concerned with judicial and municipal duties. They used convicts from Dacca jail to perform the essential municipal works. The medical ideas regarding the city and its urban problems continued to be dominated by non-medical authorities in colonial India. The Magistrate superintended the new Committee consisting of a Magistrate Collector and surgeon. Appointment of the Committee under the superintendence of the Magistrate was the second phase of government policy and of 'repression' of medical independence.

The first cholera epidemic of 1817 created panic among the European inhabitants, as well as the Indian population, even though Ewart¹⁹ claims that "Europeans had greater immunity from

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the disease than the bulk of the Indian population". This was probably due to the fact that European population in British India was given the basic facilities in sanitation which meant provision of pure water, good diet and healthy living conditions.

Nevertheless, the cholera epidemics did affect them. Moreau,²⁰ the first physician to contribute to the statistics of cholera epidemic, estimated that in the period between 1817 and 1831, about one-tenth of all British troops perished in India and about 18 million perished in the whole of India. A new Committee, called the Committee of Improvement, was formed in Dacca in the year 1819.

This time again the government kept away from sanctioning any grant of specific funds for municipal and public works.²¹ Convict labour was still the only form of labour available for clearing the city of accumulated debris, ruins and abandoned huts.

Professional direction in matters of health in the city of Dacca was not feasible until 1823 when John Adam, the then Governor-General, assigned funds for the benefit of the population of Dacca. For the first time, medical men were made members of the Committee. 4174 Streets were widened, more jungles were cleared, bridges were expanded, facilitating easy communications between the town and the outskirts. In addition, canals were constructed replacing the filthy and stagnant swamp with an ever-flowing water channel.

The length of time it took to establish public health priorities shows how medical interests were still subservient to

commercial interests in the early years of British India. The State was confined to maintaining law and order and creating an administrative machinery. The basic difference between the policies followed in Britain and India lay in the priority for provision of health. That is, the late element in the development of the health policy in Britain - which was the concern for the Army - formed the starting point of policies in colonial India. Mortality, sickness and invalidity among the European population in British India can be seen as the major force guiding British administrators to introduce public health measures in India. These were caused mainly by fevers, dysentery, diarrhoea, liver diseases and, most important of all, cholera. Since the European population was concentrated in the three towns in the Presidencies of India, namely, Calcutta, Bombay and Madras, all attempts were made to protect the British population from the epidemics ravaging these towns; the three towns were also the seats of government administration as well as the major ports.

Regular reports on the sanitary conditions prevalent in the barracks, hospitals and transport ships formed the basis for sanitary improvements in these areas. This sanitary perspective was largely influenced by the

"growing recognition in England of importance of sanitation and a clean environment".²²

With the 1857 Mutiny and the subsequent take-over of the Empire by the Crown in 1858, army health became the prime concern of

colonial health policy. For the army remained the largest single force in the Empire providing strength and security to the British rulers. The number of British troops was raised by 60 per cent in 1860. This increase followed the recommendation of the first Royal Commission appointed in 1858 to work out the army's reorganisation. In 1859, another Royal Commission was appointed to look into the conditions of health of the army in India. Ronald Martin, an Army official in India, wrote medico-topographical reports of 1835, and sanitary statistics of the districts, stations and cantonments [permanent military stations] which provided a guideline for sanitary reform in India. However, it was not until 1864 that the first Presidency Sanitary Commissions were set up based on the high mortality rate in the army.²³ Their prime concern was to

"assist in all matters relating to the health of the army and to supervise the gradual introduction of sanitary improvements in barracks, hospitals and stations on a continuing basis".²⁴

Collection of vital statistics was an important duty of the Sanitary Commission's Public health policy.

Public health issues in British India, during the 1860s, were especially pressing because of the very high fatality rate among the European army. Ramasubban²⁵ reported that about one-tenth of the British troops perished in northern India, similar to that reported by Moreau²⁶ for the period between 1817 and 1831.

Alteration was proposed in the medical curriculum for better health provisions. Medical courses, for instance, were strengthened in England following the recommendations of the Royal Commission that

"after the first entrance examination, candidates for posts in the Army Medical Department should be put through a course on military hygiene and clinical military medicine and surgery".²⁷

A medical school was established at Netley to train these medical men; also, an advisory board in military hygiene was constituted thereafter.

The appointment of provincial sanitary commissioners in India in the 1860s and after, proved significant to framing the health policy in India. For the reports of Commissioners highlighted the relationship between cholera epidemic and climatic and geographical factors. But these statistics alone were not strong enough to change the State policy for they revealed the enormity and not the means of preventing cholera epidemic. The emphasis was more on the number of deaths rather than on preventing these from dying. And it was ^{the} only in the 1890s when 'contagionism' [theory of infection or spread of disease] came to be accepted that State intervention seemed possible.

The causes of most major illnesses were not fully known until the end of the nineteenth century. Lack of knowledge thus inhibited

sanitary work. Consequently, the public health policy focused on curing diseases for which there was a known cause. Robert Koch's discovery in 1883 of Cholera vibrio, which was a victory for the water-borne theory of infection²⁸ led the Indian medical officers to focus on pure water supply to precede sewerage and drainage. In the 1890s, most of the urban public health activities concentrated on providing filtered water - these were pursued in Calcutta, Bombay, Agra and Benares where high expenditure was incurred on constructing reservoirs, pipe-lines and pumping stations.

Prior to the 1860s, the medical profession thus confined its resources to studying and treating diseases in the hospitals of India. Consequently, there was no attempt at combating disease in its social and environmental conditions, unlike the attempts made in Britain. For this reason, Martin claims, hospitals were preferred to dispensaries which offered little opportunity for observation of the patients in their social and environmental surroundings.²⁹

The advances in western medicine and sanitation began to influence the medical interests in India. The use of legislation, for instance, in order to make vaccination compulsory in Britain was followed and encouraged in India too. Success in handling cholera in Europe was an obvious model to emulate in India. But in India, implementation of similar measures involved other factors as well. Compulsory vaccination was unpopular because of religious prejudices. Preference for inoculation was based on the importance

of the cultural and religious context of medicine which were ignored by vaccinators. Suspicions about hospitals and vaccination were expressions of a deeper suspicion of the colonial regime itself, which the villagers saw as

"violating their religious and social taboos".³⁰

It was only when Indian intermediaries, who were more sensitive to Indian sentiment, were involved that the Indian hostility could be effectively overcome.

Measures to prevent cholera were, at the outset, implemented in the areas where British troops were stationed. The use of anti-cholera vaccine, discovered by W.M. Haffkine in 1890s, contributed to adopting inoculation in Bengal. It was after 1914 that these measures were spread to civilian population, probably done under nationalist pressure from the Indian population. But again in the 1920s and 1930s, the fear from the Indian population and differences of ruling authorities with the Indian National Congress arising from the Civil Disobedience Campaigns, affected State attempts to extend compulsory preventive measures. Any forceful measure, the State recognised, would be "deeply resented" which might affect the prevailing political situation in the country. Cholera mortality, however, could not decline until the 1930s when with the abeyance of famine and improvement in medical technology, even the popular level accepted State intervention in public health.³¹

Indian attitudes to Disease

The intricate relationship between Cholera and Hinduism influenced State implementation of a coherent public health policy, for cholera, in British India.

The villagers attributed the occurrence of cholera to the wrath of the deity. They interpreted the epidemic in terms of the violation of Hindu religion by slaughtering cattle to feed British troops camped in a sacred grove.³² Not only in Bengal, villagers in the district of Madras, too, believed in the occurrence of the epidemic outside the sphere of natural causation; they traced the epidemic to the pollution of sacred tanks by the low-caste soldiers.³³

The concept of identification of epidemic disease with divine wrath, as Arnold³⁴ claims, was prevalent not only in India but in Europe and America, too, especially in the epidemics of 1830s and 1840. Apart from cholera, the case of smallpox epidemic in India also affords an understanding of the obstacle to the spread of vaccination for its effective control. Smallpox was identified with goddess Sitala, believed to embody the protective and generative powers as well as destructive powers causing social harm. The practice of inoculation against smallpox was common among Indians — who performed it

"within a context of religious ritual, as an invitation to Sitala to take protective possession of the devotee".³⁵

The person inflicted with the disease was then looked upon with reverence, for the people believed that the goddess resided in his body; worship of Sitala was, then, timed to coincide with the onset of the smallpox season.

Indian response to cholera epidemics was different from that of smallpox for two reasons; firstly, because there was no recognised cholera deity in the early nineteenth century and secondly, in the absence of the deity there was no technique of inoculation for which to invoke a goddess's blessing. And it was not until the second half of the nineteenth century that cholera was identified with the deity, Olabibi ['the lady of the flux'] by Muslims and Olai-Candi in the North and Mariyammā in the South by Hindus.³⁶

Arnold³⁷ reports the actual response amongst the Indians. The villagers, he reports, often dressed up a woman, often a young girl, to represent the goddess and to receive her worship, who "acted as a channel of communication between the irate or offended deity and the afflicted villagers" [the girl was expected to voice her demands and opinions in the form of a goddess].

The belief in disease goddesses was seen by colonial administrators as posing a threat to their rule. For the elaborate ceremonies and worship carried out in order to appease the cholera deity would create panic and disturbance at the time of the epidemic.

The cholera epidemics of the nineteenth century then indicated some important aspects of Indian and Western culture. One, it exposed the wide cultural gulf that existed between the two, also indicating rural solidarity over which colonial administrators apparently had no control. Two, it exposed the attitude of the Indians to the epidemic which, in turn, indicated the divergence between indigenous and western modes of coping with the disease. However, until the early half of the nineteenth century both indigenous and western medical practitioners showed a degree of harmony in that European doctors made use of humoral treatment [details in Chapter II] as well as indigenous therapies in medical practice - prescribing black pepper, ginger, calomel mixed with opium which, in the second half of the nineteenth century, gave way to cholera pills which were made up of these.³⁸

Quarantine regulations followed by the State in order to prevent the cholera epidemic were yet another factor affecting the response of the indigenous population to the epidemic, for it engendered a reaction against isolation of the patient. The Indian view of disease causation and treatment at the time was closely

linked with family involvement and religious ministrations. Because of this, the Indian population was strongly opposed to isolation in hospitals for treatment of cholera. Such measures may have been followed with a view to preventing the spread of the disease, especially to the European population.

Malaria in India

British policies of improving urban health limited deadly diseases like cholera but at the same time encouraged malaria, tuberculosis and plague.³⁹

Expanded water supplies in India had some adverse consequences. They helped the breeding of mosquitoes and thus the intensification of malaria. In Britain, on the other hand, public health policies very rarely met with such effects. Malaria was rare in Britain, for it is a disease of the tropical climates. C.A. Bentley, Director of Public Health in Bengal and S.R. Christophers of the Punjab Health Service, attributed malarial depredations to environmental changes in the country. Other public health authorities in India also agreed that

"irrigation works and road and railway construction, particularly near the sea coast and large rivers, were a prolific source of the dissemination of malaria. Burrow pits made for embanking roads and railways became nurseries for mosquitoes".⁴⁰

In a situation like this, it was unlikely that malaria could be brought under control at the time. This would mean that the public health policies in Britain could not be successfully transferred to the Indian situation which was vastly different with respect to the climatic and geographic conditions.

The late nineteenth and twentieth centuries witnessed a "useful crescendo of death".⁴¹ Epidemics of malaria, plague, cholera and dysentery ravaging different parts of India, took a heavy toll of life. There is a recorded death rate of 40 per thousand in the 1880s which advanced to 50 per mille by the 1910s.⁴² Since the people died in as extraordinarily high numbers as they were born, the population expanded at a relatively slow rate of .4% a year; this was the rate between 1871 and 1921. Klein⁴³ relates the slow population growth and high death rate with the inability of the British to transform Indian standards of living. The slow growth rate of the population can be gauged from the Census below:

<u>Bengal Census</u>	
1872	34,691,799
1881	37,020,563
1891	39,812,165
1901	42,888,194
1911	46,312,262
1921	47,599,233
1931	51,087,338

[the precise population of India before 1871 is not known. Davis, however, readjusted the first National Census to compensate for changes in geographical area and undercounting. In 1871, David recalculated India's population as 255, against 203 given in the National Census. See K. Davis, Population of India and Pakistan, 1951, Princeton].

The population growth of India was limited by the impact which the various health hazards had on the birth rate. Klein argues that the slow population growth and the high death rate resulted from British colonial policies. In this section thus, I shall discuss briefly the malaria epidemic and its prevalence as a result of colonial policy in transforming the Indian social structure - i.e. the economy, technology; the major part of the discussion includes India as a whole, but this should give us an insight into the impact in Bengal, as Bengal was the seat of administration where most of these changes were carried out.

Davis explains the relationship between diseases and the havoc they caused.

"Epidemics caused massive fatalities and flourished virulently. In the 1890s and later, epidemics of malaria, cholera and other diseases occurred in regions in which they had been endemic for decades. By 1890, for example, over one hundred million Indians were malarial, but immunity from India's greatest killer was short-lived, and the epidemic of 1908, which occurred mainly where malaria was endemic, was probably the most severe of any known".⁴⁴

Between 1890 and 1921, malaria claimed about 20 million lives.⁴⁵

Changes in the economy of India brought about by the British also facilitated the spread of epidemic and endemic diseases in India. The increased mobility of the Indian population, the shift of labour from villages to developing industrial towns of Calcutta and Bombay, and the tea plantations of Assam promoted the spread. Besides, building of transport and irrigation facilities changes the environment. The case of malaria epidemic in India, especially in the Eastern half in Bengal was largely influenced by the public health development projects initiated in British India. Malaria was the greatest destroyer of lives claiming about 20 million lives from

the mid-1890s to 1921; respiratory diseases, bronchitis and the like were the next most fearsome killers in India.

The construction of railway networks interfered with natural drainage, where embankments and bridges acted as a 'dam'. The 1860 malaria epidemic was reported to be due to the "silting" - the process by which "many streams and rivers of the Delta were filling up".⁴⁶

The urbanization of India in the late nineteenth century reflected both favourable and unfavourable results of "engrafting the traditional Indian social system".⁴⁷ The expanded water supplies and water loggings which helped the breeding of mosquitoes and the intensification of malaria could quite easily be related to the rise in death-rate from the mid-1890s in cities with the new system.

	Urban Death Rate [per mille]	
	5 years before filtered water	5 years following filtered water
Benares	39.99	48.81
Kanpur	41.15	47.83
Lucknow	44.68	43.79
Agra	32.13	35.46
Meerut	32.13	35.06
Allahabad	25.77	28.70

Source: Klein, 1973 [see footnotes].

The provision of public health measures were spurred by the economic and political factors, and the consequences of malaria became increasingly serious. The impact ranged from the continual loss of productivity and workdays to high infant and adult mortality and the eventual collapse of towns and areas during epidemics. Anti-malarial efforts may well have been pursued in order to restore the loss of productivity. This is also evident from the sporadic provisions to areas of agricultural or other productions for export and areas of concentrated British population.⁴⁸

Summing Up

It is clear that the growth of public health policies in Bengal, as also in the rest of India, was slow. In the early period, the prime issue was the health of the Army and the colonial population, and throughout the period the dominant concern was with administrative control and commerce.

The lack of sensitivity to the social conditions prevalent in India resulted in opposition by the indigenous population, and hence lack of successful implementation of health policies. This was coupled with the lack of sensitivity of British administrators to the inter-relationship of diseases and the structure of their causes in the Indian context. Commercial interests, too, guided these ideas. For they believed that acceptance of India as the homeland of cholera would interfere with commercial relations with India. This remained a strong view up until 1885 when the authorities maintained that cholera was not transmissible from man to man.⁴⁹

Broadly speaking, the response of western medicine to epidemic diseases in India was similar to that of indigenous medicine. It placed an emphasis upon individual and curative treatment. Given the spectacular successes of public health policies in Britain, it might have been suspected that western medicine would have

established a dominance through these successes in India. But for the reasons outlined, the real divergence between western and Indian medicine occurred only after the dramatic improvements in drugs produced by western medicine towards the end of the nineteenth century [as shown in Chapter III].

F O O T N O T E S, Chapter V

1. R. Ramasubban, Public Health and Medical Research in India - their origins under the impact of British Colonial Policy, 1982, SAREC Report.
2. Ibid.
3. C.E. Rosenberg, "Cholera in Nineteenth-Century Europe: A Tool for Social and Economic Analysis", Comp.Stud.Soc.His., 1966, Vol.viii, pp.451-463; p.454.
4. According to Devonshire, it was in 1876 that Robert Koch discovered that specific bacteria caused specific animal disease. See Devonshire in R.H. Shryock, Development of Modern Medicine, 1947, New York, Alfred Knopf, p.282.
5. C. Wilcocks, Medical Advance, Public Health and Social Evolution, 1965, London, p.99.
6. Chadwick was a barrister and journalist working on human welfare.
7. Wilcocks, op.cit., p.100.
8. Ibid.
9. D. Arnold, "Cholera in Colonial India" (unpublished), 1985.
10. Shryock, op.cit.
11. Ibid., p.294.
12. See F.F. Cartwright, A Social History of Medicine, 1977, London, Longman.
13. W.M. Frazer, A History of English Public Health: 1834-1939, 1950, London. Tindall and Cox, pp.1-2.
14. H. Jephson, The Sanitary Evolution of London, 1967, p.45. See also J.B. Harrison, "Allahabad: A Sanitary History" in K. Ballhatchet and J. Harrison (eds.), The City in South Asia, 1980, London, Curzon Press, pp.167-195.
15. Frazer, op.cit., p.56.
16. Harrison, op.cit., p.256.
17. S.U. Ahmed, "Urban Problems and Government Policies: A Case Study of the City of Dacca, 1810-1830" in Ballhatchet and Harrison (eds.), op.cit., pp.129-165.

18. Ibid.
19. J. Ewart, A Digest of the Vital Statistics of the European and Native Armies of India, 1859, London, p.2.
20. See A. Moreau de Jonne's in Arnold, op.cit.
21. Ahmed, op.cit.
22. Ramasubban, op.cit.
23. The Sanitary Commissions were the recommendation of the Royal Sanitary Commission Report of 1863.
24. Ramasubban, op.cit., p.16.
25. Ibid., p.17.
26. Moreau de Jonne's in Arnold, op.cit.
27. Ramasubban, op.cit., p.13.
28. See Indian Sanitary Proceedings, 1871, Vol.6714, Progs. 4-5. See also I. Klein, "Death in India, 1871-1921", J.As.Stud., 1973, Vol.XXII, no.4, pp.639-659; p.639.
29. J.R. Martin in Proceedings of the Governors of the Native Hospital Relative to the Establishment of a Fever Hospital, 1838, pp.14-15. See also Arnold, op.cit.
30. Arnold, ibid., p.179.
31. R.E. McGrew, "The First Cholera Epidemic and Social History", Bull.His.Med., 1960, Vol.xxxiv, pp.61-73, p.64.
32. W.H. Sleeman, Rambles and Recollections of an Indian Official, 1844, Vol.1, London, pp.211-212.
33. See W. Scot, Report on the Epidemic Cholera, p.237.
34. Arnold, op.cit.
35. P.R. Greenough, "Variation and Vaccination in South Asia c.1700-1865", So.Sc. and Med., 1980, Vol.xiv, pp.345-347. See also R.W. Nicholas, "The Goddess Sitala and Epidemic Smallpox in Bengal", J.As.Stud., 1980, Vol.xli, pp.21-44.
36. C. Macnamara, A History of Asiatic Cholera, 1876, London, pp.34-36. See also Arnold, op.cit.
37. Arnold, ibid.

38. Reports on Cholera, 1856, in Arnold, *ibid.*
39. Klein, *op.cit.*
40. C.A. Bentley and S.R. Christophers quoted by Kelin, *ibid.*, p.646.
41. *Ibid.*
42. K. Davis, Population of India and Pakistan, 1951, Princeton.
43. Klein, *op.cit.*
44. K. Davis quoted by Klein, *ibid.*, p.645.
45. Bentley and Christophers in Klein, *op.cit.*, p.643.
46. Indian Medical Proceedings, GOI, 1873-75, pp.507-508; pp.521-530.
47. Klein, *op.cit.*, p.652.
48. See J.A. Sinton, "What Malaria Costs India", Hlth.Bull., 1956, No.26, GOI.
49. *Ibid.*

C H A P T E R V I

ETHNIC BACKGROUND IN MEDICAL EDUCATION

We have argued that for most of the nineteenth century, western medicine was advantaged by its near monopoly of government positions. However, as we noted in Chapter IV, the attractiveness of government employment was diminishing towards the end of the century. The government needed to take steps to keep trained personnel in its service and out of private practice.

The advances in western medicine increased the attractiveness of western medicine to the Indian population. As private practice grew, those best placed to engage in it were those rich enough to afford an appropriate education. As we shall see in this chapter, from the last decades of the century, training in western medicine grew very rapidly not only at Calcutta Medical College but also in the medical schools. By contrast, no Muslims attended the Medical College. In their earlier days, the schools drew from the population largely in proportion to the ethnic mix. For example, in 1881, Hindus were only slightly advantaged over Muslims. As medical training became more standardised and as English became more and more the medium of instruction, those sections of the population with the best education and access to English language education, were progressively advantaged.

Vernacular classes had been transferred from the College to the government schools in 1873. One effect of this was to raise the standards in the schools. By the 1890s, all government schools were requiring competence in English as an entry requirement, and by 1905, they all demanded a pass in a University matriculation examination, though this was relaxed on occasions for Muslim students. The need for this relaxation indicates the advantage of the Hindu over the Muslim population in education.

By the end of the nineteenth century, the Calcutta Medical College was training students for medical degrees granted by Calcutta University and College diplomas at a slightly lower level which, among other things, afforded positions as military assistant surgeons for the Army. The medical schools granted diplomas which could give employment in government service as hospital assistants, but more usually by this time were used as qualifications in private practice in India.

The Bhadrakalok in Bengal

In Bengal, the section of the population best placed to take advantage of the new attractiveness of western medicine was that section of the Hindu population that came to be known as the Bhadrakalok. Members of the Bhadrakalok included the three upper castes of Bengali Hindu society, namely, Brahmin, Baidya and Kayastha.

After the establishment of British control over Bengal in 1757, the fathers and grandfathers of what later came to be called the Bhadrak, entered into relations with

"British commercial, financial, and administrative organizations in Calcutta, from which they realized great economic benefits".¹

A close relation had developed with a small section of the Bengali Hindus and British administrators during the early decades of the nineteenth century.

Broomfield summarises the Bengali Bhadrak as follows:

"In city, town, and village there was one group of Bengalis who claimed and were accorded recognition as superior in social status to the mass of their fellows. These were the Bhadrak, literally the "respectable people", the "gentlemen". They were distinguished by many aspects of their behaviour - their deportment, their speech, their dress, their style of housing, their eating habits, their occupations, and their associations - and quite as fundamentally by their cultural values and their sense of social propriety. Besides being of the three upper castes, the Bhadrak were also distinguished by their preference for the literate professions and office jobs precluding "any occupation involving manual labour".²

The basic distinction between bhadra and abhadra, or between high and low, as they were commonly grouped, arose from the former's abstention from manual labour and "their belief in the inferiority of manual occupations".³ The stigma attached to manual labour became apparent and rigid to such an extent that the term Bhadrlok was often used as a synonym for high caste.⁴ Even though physical labour was considered degrading, the practice of medicine, as we shall see, was not affected by these prejudices and though any caste, theoretically, could acquire the status of bhadralok in Bengali society, most of its members came from the above three castes. Western education played a significant role in influencing the status of the Bhadrlok in Calcutta, so much so that it became the 'hallmark of their status'. By the last decades of the nineteenth century, English education leading to a university college in Calcutta and white-collar employment⁵ had become the accepted ideal which every Bhadrlok family aspired to. They sought for their children

"education at the Presidency College, an English university or the Inns of Court in London, and success in the Indian Civil Service [I.C.S.] examination, at the Bar of the Calcutta High Court, or in one of the other learned professions of the capital". "The 'school'", as recorded in a Bengal government report in 1928, was "the one gate to the society of the bhadralok".⁶

The Bhadrlok then came to be associated with western style of life. The new forms of land revenue settlements and land tenure introduced by the British in late eighteenth and early nineteenth centuries influenced the hereditary zamindars, and by the late nineteenth century, the place of the old Muslim and Hindu aristocratic families was taken by a

"host of lesser parvenus", mostly high-caste Hindus, "who valued landed property for the superior prestige and security resulting from its possession".⁷

It was those families in receipt of rent who sent their sons to government service and the learned professions.⁸ Bengalis then seem to have associated themselves with the British as early as the eighteenth century, when several Hindu bankers and traders were engaged to assist with the increasing trading activities of the British. These included the Bengali trading and banking castes, Suvarnavanik and Gandhabanik.

Membership of Bhadrlok society was not wholly ascriptive. Even a low-caste Hindu or Muslim could gain acceptance as a Bhadrlok by obtaining urban professional employment through English education. The high economic status coupled with the association of the Bhadrlok with western culture and subsequent adoption of 'the specific style of life', probably 'alienated' them from the rest of the Bengali society in British India.

I shall now turn to show that English education grew very rapidly in Bengal and that the Bhadrakalok came to be increasingly associated with it.

English Education and the Bhadrakalok

The year 1835 provides a meaningful starting point for this issue for two reasons. One, it marked the end of the Orientalist-Anglicist controversy, and two, it was the year of the introduction of English as the language of instruction in all arts and sciences. In this section, I shall focus on the policies framed by British administrators to spread English education in India, and how they were implemented in the Presidency of Bengal.

As is clear from Table I, the State commenced its educational policy by financing English schools. By 1838, there were some 6000⁹ pupils in Bengal, taking courses in English. While Bentinck's policy favoured English education, that of Auckland, who succeeded Bentinck as Governor General, emphasized oriental institutions along with instructions in English. In 1839, this figured as an important feature of Auckland's Minute on Education . which stated that,

TABLE I

Government Expenditure incurred on English education
for the Indian Population in the Presidency of Bengal

	<u>Year</u>	<u>Amount (Rupees)</u>
a.	1834-35	216,125
	35-36	198,121
	36-37	329,567
	37-38	402,238
	38-39	332,315
	39-40	387,023
	40-41	393,054
	41-42	553,635
	42-43	424,835
	43-44	404,340
	44-45	440,788
	45-46	469,271
	46-47	500,393
	47-48	559,742
	48-49	620,579
	49-50	534,164
	50-51	523,620
	51-52	515,728
	52-53	521,924
b.	54-55	495,380
	55-56	808,030
	56-57	943,220
	57-58	1,038,390
	58-59	1,024,350
	59-60	797,610
	60-61	806,170
	61-62	880,780
	62-63	993,060
	63-64	1,123,760
	64-65	1,255,610
	65-66	1,380,470
	66-67	1,385,760
	67-68	1,659,430
	68-69	1,754,990
	69-70	1,822,460
	70-71	1,865,980
	71-72	1,814,040

Note: .

- a. Source for 1834-35 to 1852-53 is Returns of Sums spent on Native Education in India 1834-1854, Vol.47 (Statistical Abstracts).
- b. Source for 1854-55 to 1871-72 is Statistical Abstracts Relating to British India (relevant years) which gives Figures for this period in Pounds. The Exchange Rate has been taken from Reports from Commissioners, Inspectors and Others: Administration of the Expenditure of India, Vol.XVI, 1896. (House of Lords - East India Papers, Vol.XI).

"although English was to be retained as the medium of higher instruction in European literature, philosophy and science, the existing oriental institutions were to be kept up in full efficiency and were to receive the same encouragement as might be given to the students at English institutions. Vernacular instruction was to be combined with English, full choice being allowed to the pupils to attend whichever tuition they might individually prefer".¹⁰

We do not know how far this was true because Educational Records of 1830 to 1854 indicate that Auckland, despite his emphasis upon oriental instruction, rejected Adam's scheme of vernacular education in Bengal.¹¹ The rejection of the plan may have followed up the Public Instruction Committee's move

"to use English as a stepping stone to the creation of a system of national education".¹²

By 1844, however, vernacular schools were being established in the rural districts of the Provinces of India.¹³

Yet another transition in the educational policy was obvious in 1842 when the educational sphere was taken over by the Council of Education in Bengal, prior to which the State had direct control over education without any specific Council; similar Councils took over in Madras and Bombay Presidencies. The main task of the Council was to finance institutions of English education, but

expenditure was modest over the period of its existence. As Table I shows, the expenditure incurred on native education fluctuated quite widely between 1835 and 1853, and there was no immediate increase upon the establishment of the Council of Education.¹⁴

The Council did, however, bring forward proposals for the restructuring of western style education. They wished to create a formal system of education and examination to open avenues for higher education. They proposed the establishment of a University in Calcutta, arguing

"the present advanced state of education in the Bengal Presidency renders it advisable to confer upon the pupils some mark of distinction by which they may be recognised as persons of liberal education capable, from the literary and scientific training they have undergone, of holding the higher offices under government open to natives, after due qualification, or of taking the rank in society to all members and graduates of the University".¹⁵

The proposed University was to be empowered with granting degrees in medicine, besides Arts, Science, Law and Engineering. However, the establishment of a University would have entailed expenditure which the government, at that time, did not fully desire. It was not until the year 1852-53, when the State in British India renewed the Company's Charter, that the proposals were reconsidered.

An important phase in the history of western education in India was marked by Wood's Despatch of 1854, also referred to as the 'Magna Carta' of Indian education, because of certain significant tasks it set to the government.¹⁶ The objects of the Despatch were manifold, chief amongst which were spreading western culture, securing servants for public administration and introducing English as the medium of instruction at the Collegiate level; the Charter constituted an important recommendation of the Select Committee¹⁷ of the House of Commons set up by the government in 1853 to institute an inquiry into the educational progress of India.

Three major changes in the state of education in Bengal took place from the time of publication of Wood's Despatch of 1854. One, it created a Department of Education in the Province of Bengal [Madras and Bombay followed suit] headed by the Director of Public Instruction. This represented a significant shift in the power of supervision and control of education. Two, the University of Calcutta, followed by those of Bombay and Madras, was founded following the Despatch, in the year 1857. Though the idée reçue behind such a move was to encourage higher education - a regular and liberal course of education - it had implications for medical education as well. The Calcutta Medical College, for instance, was made the medical faculty¹⁸ then exercising control over administration of medical studies. Added to the attainments shown by students of English institutions was the success of the Medical College in terms of educating students in western medical

science¹⁹ - and the requirements of an increasing European and Anglo-Indian population which the Court of Directors of the Education Department took into account while framing policies for establishing Universities in India. Other changes followed this Act. The Senate, for instance, was divided, by the orders of the Governor-General in Council, into four faculties, namely, Medicine, Arts, Law and Engineering.

From the time of its foundation to that of the formation of the Calcutta University, the Calcutta Medical College had enjoyed the privilege of granting a diploma in medicine and surgery. This power continued with the establishment of the University. But the most advanced classes began teaching for the University degrees, degrees of Licentiate in Medicine and Surgery, and Doctor of Medicine.²⁰

The third significant event following the Despatch was the increase in the number of English schools for education of Indians supported by the government; the increase was seen in the high schools, middle and primary schools. Between 1855 and 1858, there was a fourfold increase in the institutions accompanied by a steady rise in pupils. The introduction of a Grant-in-aid system subsequent to the Despatch of 1854, increased the number of schools in almost every district of the Bengal Presidency. However, government policy after 1854 remained much the same as before in that it continued to support the same kind of institutions. Schools which were to be given aid were mostly privately managed under the

auspices of the educated and wealthy natives of the province. In order to receive grants they agreed to subject themselves to inspection by the government.

The year 1857 brought to an end the rule of the Company in India and a subsequent change in the administrative policies. Lord Stanley, the first Secretary of State for India, in a Despatch of 1859, partly transferred the control of education from Central to provincial governments.²¹

The changing economic conditions of the nineteenth century largely influenced the Bengali society in terms of adopting western culture and life. The success of the Bhadrakalok in their commercial dealings with the British in the period 1800 to 1850 was an added factor to the Bhadrakalok movement. After 1850, Bengalis started to withdraw from commercial affairs following a series of commercial crises and increased British exclusiveness.²² However, there were increasing opportunities of white-collar employment for the Bengalis who had had an English education.²³ From Table II, it is clear that the Hindus represented a large proportion of those in government services. Muslims, in contrast, were, from the outset, found in much smaller proportions. The opening of government appointments for Bengalis encouraged the Bengali Bhadrakalok to acquire English education, and those successful obtained government appointments.²⁴

TABLE II

Return showing the Number of Government Appointments in Bengal (of not less than 150 Rupees a Month in value), filled up during the years 1867 to 1871, by Hindus and Muslims (or Mahomedans).

Year	Hindus		Muslims	
	Number appointed	%age appointed	Number appointed	%age appointed
1867	428	80%	108	20%
1868	103	87%	15	13%
1869	179	87%	27	13%
1870	73	86%	12	14%
1871	91	85%	16	15%
Population of Bengal* in 1872	-	67%	-	33%

* (Hindu Population in Bengal, 1872 = 38,975,418
(Muslim Population in Bengal, 1872 = 19,553,831

Source: Parliamentary Papers - East India, 1874, Vol.XLVII.

Even though Wood's Despatch of 1854 had led to an increase in the number of institutions, it could not meet the growing demand of the enthusiastic Bhadrakalok. And with the passage of time, in order to meet their own demands, they began to operate independently in the endowment of schools and colleges. Between 1857 and 1885, for instance, there was an increase in the number of educational institutions either totally or partly controlled by the Bhadrakalok: from 11 to 30.²⁵ Several men of status in the Bengali community in the late nineteenth century were involved with educational administration and displayed remarkable initiative in financing English language primary and middle schools in the district, and high schools and colleges in Calcutta.²⁶ The above increase in the number of schools, small though it appears, is sufficient to indicate the development of an educational role independent of State support.

In order to get the benefits of English education, the Bhadrakalok founded Anglo-vernacular as well as English schools. The Oriental Seminary, the Indian Free School, and Seals Free College were amongst the several institutions founded. Saptagram Suvarnavanik,²⁷ a traditional merchant group in Bengal, financed and maintained these schools. In addition, Hindu Metropolitan College and Calcutta Seminary were founded towards the end of the nineteenth century.

After 1870, there was a rise in population which, coupled with land fragmentation and lack of agricultural improvements, resulted in a reduced revenue from landholdings. In addition, by this time, most of the Bengali Bhadrakolk were left out of commercial development. At this stage, public service and professional employment was the only choice left for the English-educated Bengalis. And since English education was a pre-requisite for government employment, there was a sharp rise in the school and college enrolment in the 1870s.²⁸

Three principal agencies were responsible for the popularity of English education in Bengal - especially amongst the dominant classes in the decade following 1880. One, the British government which created schools and colleges not only in Bengal but in India in general. These educational institutions provided recruits for the government machinery - in offices, in the new legal system and the like, by training clerks, lawyers, doctors, technicians and teachers. Two, the Christian missionaries who were the pioneers of western education in India. Educational institutions started by them imparted secular as well as religious instructions. The principal aim of these missionaries was religious, but they played a significant role in spreading liberal western education, too, among the Indian population.²⁹ And lastly, private Indian enterprise, with Raja Ram Mohun Roy at the helm of the educational activities Roy and other Indian enthusiasts hailed English education as the key to understanding scientific and democratic thought of the modern west.³⁰

With the rise of the national consciousness amongst the Indians, the popularity of English education came to be associated, by the State, with political unrest in India. This was made more apparent by the policy of the Hunter Commission of 1882 to withdraw from direct support and administration of educational institutions.³¹ The effects of this were twofold. Firstly, Primary education was taken over by the District and Municipal Boards constituted by the above Commission. The local self-government Act of 1885 also added to their strength. Secondly, Secondary education lay with private enterprise supported by the grant-in-aid system. This we may refer to as the 'non-professional' level of control of education which may have contributed to the growth of private English schools in the years to follow - and more so in the late nineteenth century. Collegiate education, too, fell under the supervision of missionaries and private enterprise.³²

The cumulative effect of educational expenditure in previous years became obvious in the 1880s and later years. Second and even third-generation English-educated Bengalis began to demand western education at a much faster rate. Between 1872 and 1885 four University Colleges were established by the Bhadraklok. These were the Metropolitan Institution (1872), Albert College (1881), City College (1881), and the Presidency Institution (1884)³³ which was later renamed Ripon College. This seems to have marked the beginning of a shift in control of education away from the government and the missionaries to the Bhadraklok in Calcutta. The

increasing demand for liberal education among the Bhadrakalok became apparent not only among them, most of whom were landowners, but also among the class of rent chargers created by the Permanent Settlement of Bengal;³⁴ they formed a minority in English education. The admittedly doubtful Census on Occupational Classifications suggests that these rent chargers, interposed between the zamindars and ryots, increased by 23% between 1901 and 1911 and by another 9% between 1911 and 1921. The insufficiency of rents distributed to them, however, forced them to look for non-agricultural occupations. Hence, most of the landlords and rent-collectors were by no means affluent and as the Bhadrakalok population grew, the pressure on land increased which, in turn, led to greater movement and crowding into schools in the hope of finding subsidiary employment. Amongst the Bhadrakalok, Kayasthas increased by 13%, between 1901 and 1911, and Baidyas by 9% between 1911 and 1921.³⁵

As mentioned above, the increasing pressure on land reduced the once respectable class of proprietors to increasing dependence on education to enter the services of the government.³⁶ This became evident in the late nineteenth century [perhaps, late 1880s] and continued so in the three decades thereafter. The Report on the Administration of Bengal for the year 1890-1 records a greater movement of the priestly and literary castes, holding land estates in Bengal towards English high schools to be able to fit into subordinate jobs.³⁷ The impact of English education was thus

seen in the rise in the number of privileged Hindu students in English institutions. And the extent to which high-caste Hindus had dominated the sphere of western education in the nineteenth century can be gauged from Table III.

While the affluent sections of the society were making progress in English education, the government was making changes in the educational policies from time to time. Curzon's educational policy of 1901, for instance, led to the appointment of the first Indian Universities Commission in 1902, with Thomas Rayleigh as its Chairman. Once again education became the subject of control under government administration. It was following this policy that powers regarding the rules to be framed by the University Senate were vested in the government. The Senate was left with little or no say in the additions or alterations or even in framing regulations.³⁸ The long-standing 'laissez-faire' policy in the field of education thus came to an end as a result of Curzon's policy in which he brought secondary schools under State control, at the same time restricting entry into government services to students of State-recognized schools.³⁹

The move met with vehement opposition from the Indian population, a situation which became even worse following Curzon's opposition to students taking part in the national movement, commonly referred to as the Swadeshi movement. The Bengal Province pioneered the movement in 1905, the entire country eventually coming under its influence.

TABLE III

HIGH-CASTE HINDUS IN MEDICAL EDUCATION

	Total population	Brahmin	Baidya	Kayastha	Suvarna- vanik	Gandha- banik	Muslim
Male literacy per cent	10.0	63.9	64.8	56.0	51.9	51.0	6.8
Male literacy in English per cent	0.9	15.7	30.3	14.7	26.8	17.5	-

Source: Census of India, 1901, vol.VI, pt.I, pp.297-303.
(numbers not available).

In response to the above measures adopted by the State in terms of education, Indian educationists formed the National Council of Education; prominent amongst these were Gurudas Banerjee, Rash Behari Ghosh and Dr. Ravindra Nath Tagore.

The proliferation in the number of schools and colleges in the period following 1905 was then a result of the measures adopted by the National Council which also founded a National College at Calcutta.⁴⁰ While Hindus were keen on organising and spreading education on their own behalf, Muslims were awakened by the political conditions then prevalent in India, and in the year 1906 formed the Muslim League in order to safeguard their educational interests.

The Muslim League, the first political organization of the Muslim community in British India, represented the beginnings of the breakaway from the national movement. The foisting of Hindu religious ideas on the Indian National Congress, which started as a non-communal secular national organization of the Indian population, for political freedom tended to create a suspicion in the minds of Muslims that the national movement was a Hindu movement. Furthermore, Lord Curzon's policy of 'Partition of Bengal' in 1905 also weakened Indian nationalism. It created a split within the politically advanced Bengal population by creating a predominantly Muslim East Bengal and Assam as a counterpoise to a predominantly Hindu West Bengal. This division of Bengal was perhaps used as a

device by the British administrators to gain the support of the Muslim minority against the politically advanced Hindus.⁴¹

In 1917, the Calcutta University Commission was appointed under the Chairmanship of Dr. Michael Sadler to report on the state of university education. It proposed limiting the numbers of students at Calcutta University, but in the field of medical education, as Table VIII shows, far from bringing a decline the following years saw a massive rise in the number of students. Numbers in the Medical College rose sharply between 1917 and 1921, remainng constant thereafter until 1927. Medical school numbers, however, grew fast from 1917 throughout the 1920s (details later for Table VIII).

With the introduction of the constitutional reforms in January 1921, education in India became a 'provincial transferred subject'. The effect of the 'Provincialisation' was chiefly financial. Prior to this, the Government of India could encourage

"advance on the lines which it favoured by grants for particular objects from its surplus revenues".⁴²

With the provincialisation of financial control, the influence so exercised by the central government had ceased. The "transfer" of education to the charge of a Minister responsible to the provincial Legislative Council thus brought the subject directly under popular control in the nine major provinces, including Bengal. European education, however, still remained a "reserved"

subject under the control of a provincial Member of Council in all provinces, except Burma where it was under a single Minister.

Bhadralok and Medical Literature

While English education exposed the Indian population to western ideas and styles, other institutions reinforced this development. The role of the Press as the vehicle of communication of ideas was significant in this respect. The association of the Bhadralok with the Press can be traced back to the end of the eighteenth century when they were employed as consultants by Protestant missionaries wanting to publish religious scripts.⁴³ This encouraged them to start publishing their own periodicals around 1816.

The growth of the Press was slow at the outset, with only 22 periodicals in the latter half of the nineteenth century. The year 1870 witnessed a dramatic increase which continued until 1885 when about 96 periodicals were in operation.⁴⁴ As for the control of the Press, it depended largely on the patronage of wealthy elites;⁴⁵ the Bengal Gazette, for instance, was run with the support of one Hara Chandra Roy, a member of the Bhadralok section of the society. Not only did the Bhadralok communicate in English, they used the Press as an agency to publish and expound political issues and ideas of Indian nationalists at a time when the feeling of national consciousness was encouraging many young people to join the struggle for freedom.

An important area of Press activity that came into the limelight during the period 1857-1885 was concern with professions and the sciences. Publications like the Calcutta Journal of Medicine, started in 1858, and the Indian Homoeopathic Review, started in 1882, underlined the development of medical profession among the Bhadrlok in Calcutta; the former was edited and started by Mahendra Lal Sircar, a member of the Bhadrlok section and educated in western medicine. The Calcutta Medical News also figured as an important medical journal supported by this group, thus indicating the gradual rise of medical literature at the time. The English press in India, thus, was an important vehicle of communication of the new ideas.

Growth of Western Medical Education and its Ethnic Basis

In 1880, the Calcutta Medical College was producing doctors and other medical personnel for the I.M.S., and the schools were producing lower level medical personnel for government service. At that time, the College was largely dominated by Hindus and Eurasians and Europeans. There were no Muhammadan students. As Table IV and Figures ^{Ia and Ib} show, this position changed little during the decade from 1880-81 to 1890-91. There was a small increase in the number of Muhammadan students but they continued to represent a very small proportion of students at the Calcutta Medical College. However, developments in the medical schools were much more significant. In 1880, while employment was still substantially in government

TABLE IV

Ethnic Background of Students at Medical Schools
and at Calcutta Medical College, in Bengal 1880-1891

Year	Europeans & Eurasians		Native Christians		Hindus		Muhammadans		Others	
	1	2	1	2	1	2	1	2	1	2
1880-81	-	39	4	-	230	84	100	-	5	-
81-82	-	44	2	4	226	69	77	-	5	-
82-83	-	51	2	2	346	68	77	-	12	5
83-84	-	34	3	2	474	76	126	-	2	5
84-85	-	33	4	3	533	86	130	1	5	9
85-86	-	59	4	4	509	80	82	3	5	6
86-87	2	73	7	6	673	83	104	4	7	6
87-88	-	80	7	7	615	70	100	4	3	2
88-89	3	66	2	-	709	71	111	3	17	8
89-90	2	58	8	1	714	87	122	1	21	3
90-91	8	74	19	1	799	117	138	4	23	1

Source: Reports on the Administration of Bengal, 1880-1891

1 Students in Medical Schools

2 Students in Calcutta Medical College

Figure Ia

ETHNIC BACKGROUND OF STUDENTS BENGAL MEDICAL SCHOOLS

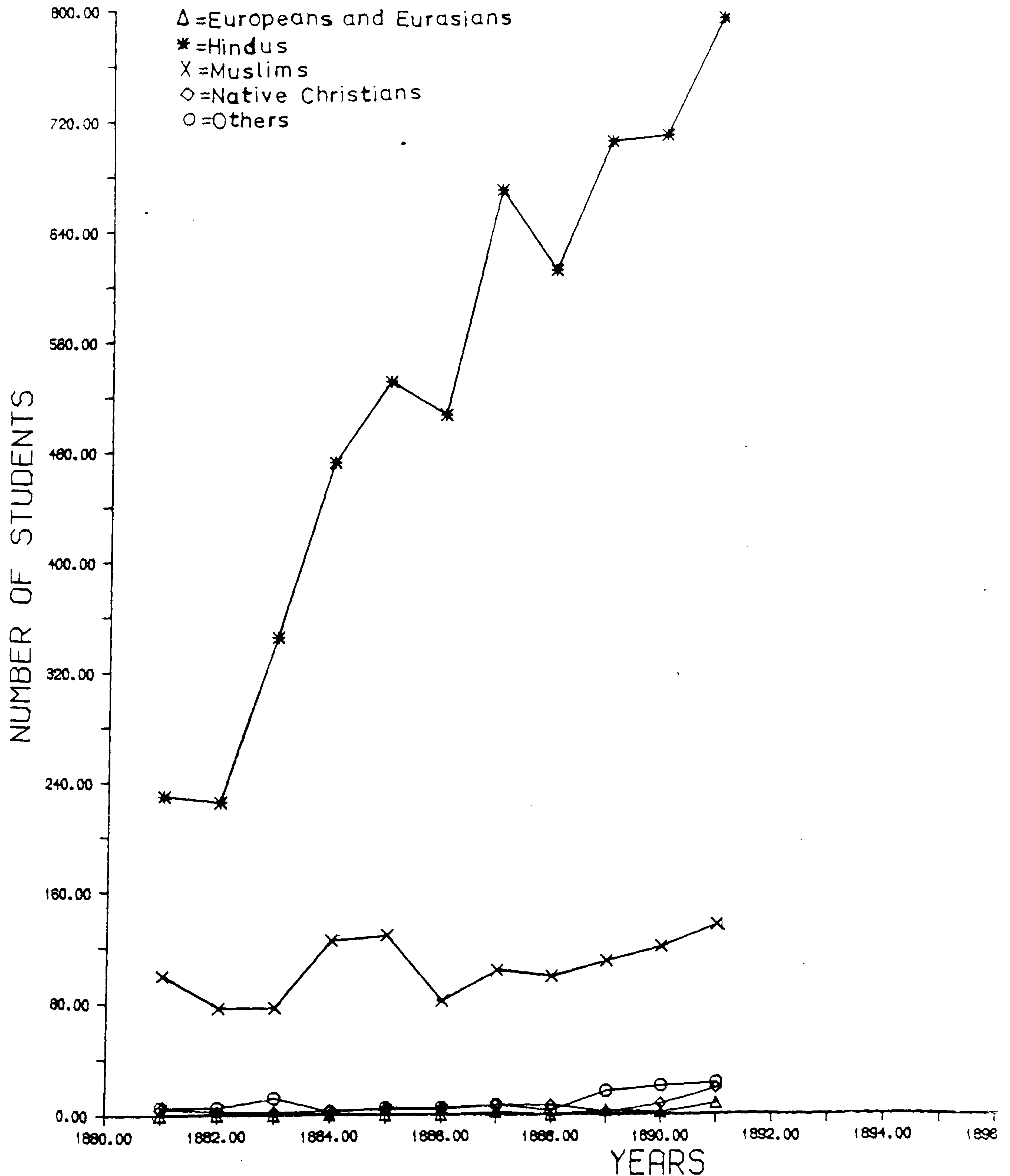
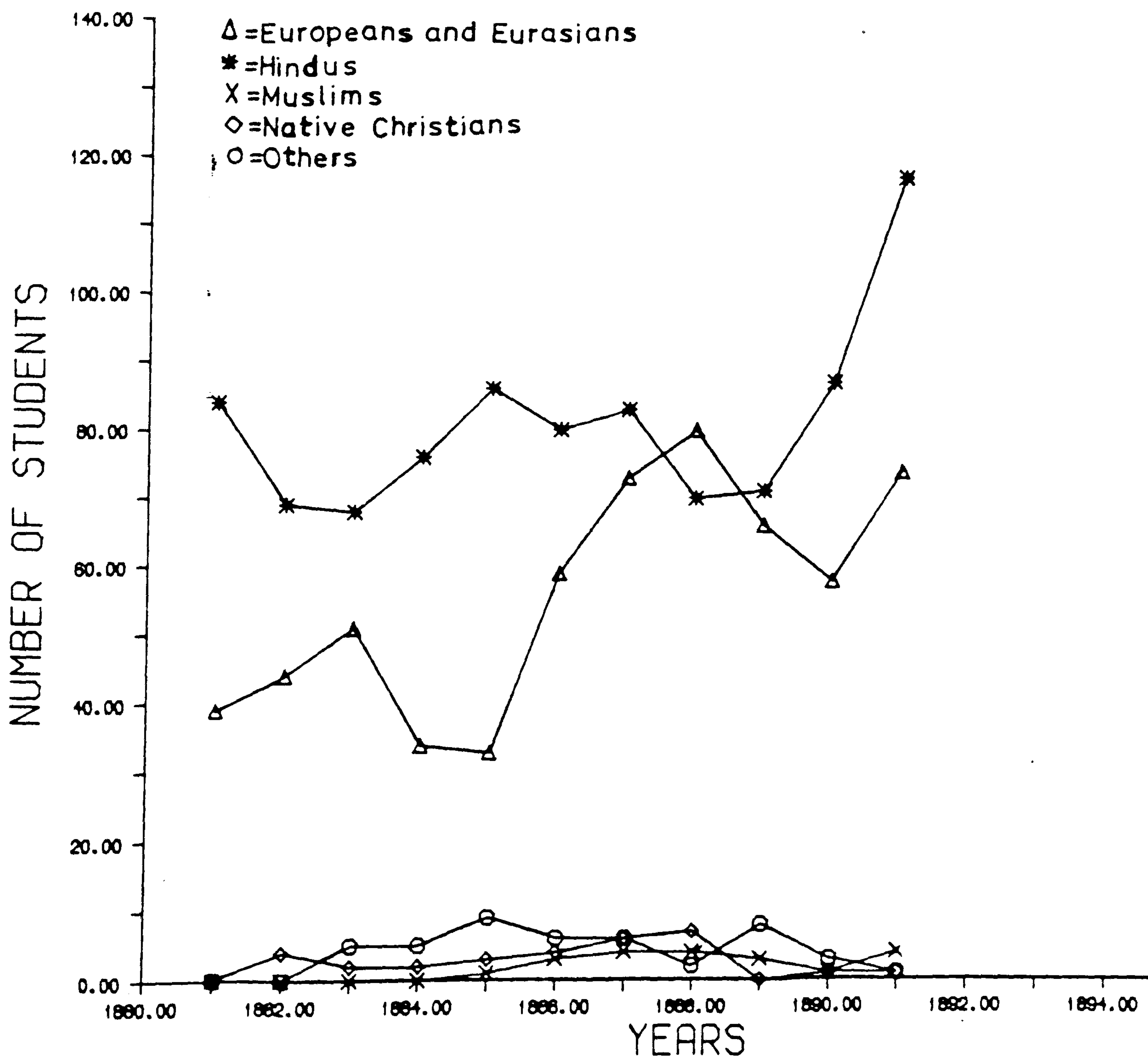


Figure Ib

ETHNIC BACKGROUND OF STUDENTS IN CALCUTTA MEDICAL COLLEGE



service, Hindus had only a slight advantage [12 per cent] over Muhammadans on the basis of ethnic distribution in the Census. Between 1880 and 1890, Hindus increased from 230 to 799, while Muhammadans increased from only 100 to 138. By the latter period, on the basis of their distribution in the population, Hindus were two-and-a-half times as likely as Muhammadans to receive an education at medical schools. This trend towards Hindu dominance was associated with a movement away from government service to private practice. In the process, the emphasis upon English education and an increasing level of entry qualification made the schools increasingly the preserve of privileged Hindus.

This process is reflected in the changes occurring in the financing of medical education. In 1886, less than 11 per cent of all expenditure on medical education came from fees (Table V), while in 1936-37, the figure was 31.5 per cent. The growth in fee-income and the growth in income from government sources are shown in Figure II. There the much more rapid rise in fee-income is clearly represented. There was a fluctuation in government expenditure from the 1880s until the First World War with an overall modest increase. In the post-war period, there was a massive rise in government expenditure, increasing nearly two-and-a-half times between 1916-17 and 1921-22.

TABLE V

TOTAL EXPENDITURE ON MEDICAL EDUCATION IN BENGAL BY SOURCES (in Rupees)

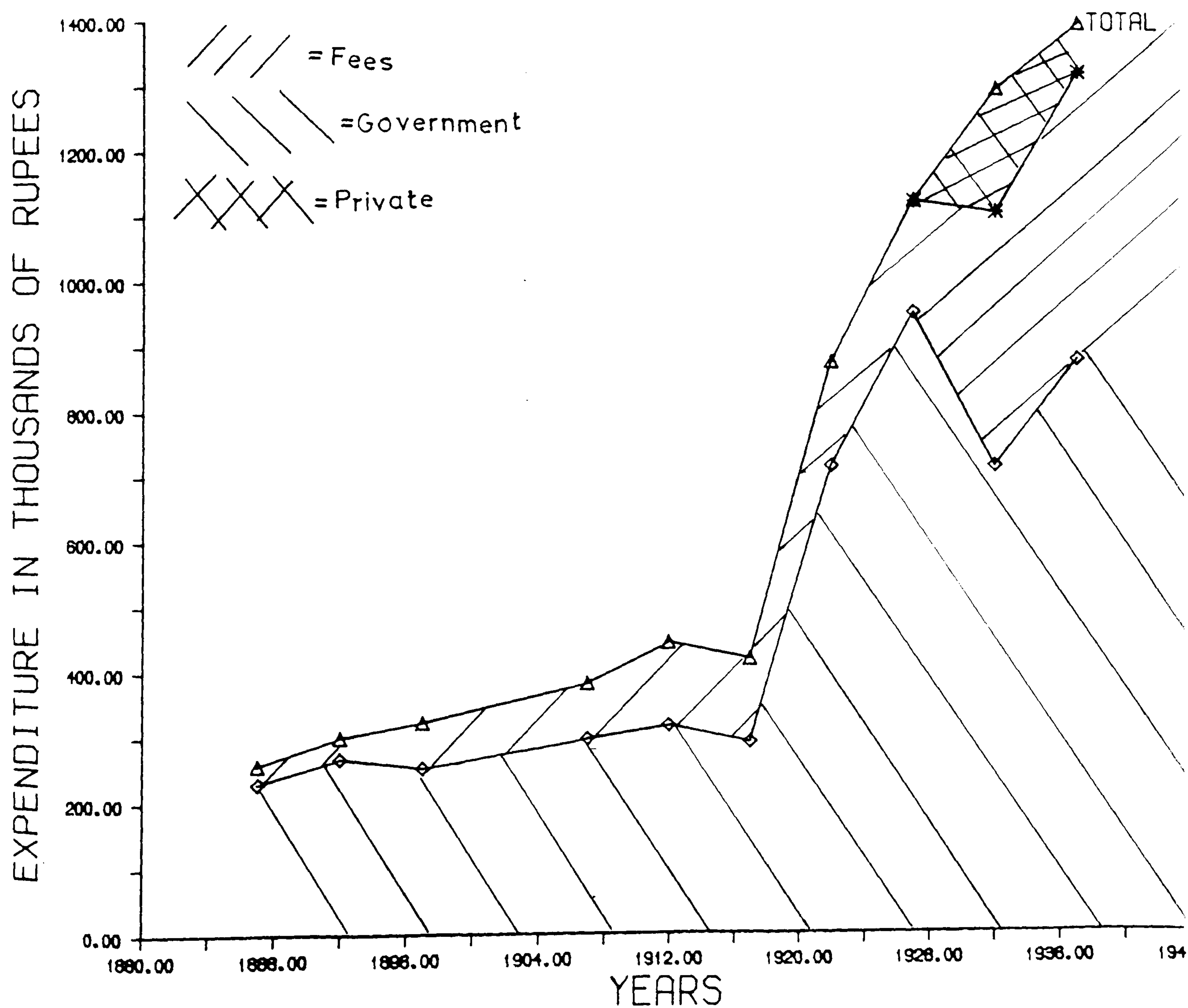
Year	GOVERNMENT SOURCES			FEES		PRIVATE (OTHER) SOURCES		TOTAL
	AMOUNT	%age	Rate of Increase	AMOUNT	%age	AMOUNT	%age	
1886-87	2,30,826	89.2	100	27,996	10.8	-	-	2,58,822
1891-92	2,69,468	89.1	117	33,006	10.9	-	-	3,02,474
1896-97	2,55,081	78.5	111	69,874	21.5	-	-	3,24,955
1901-02								
1906-07	3,00,41	78.1	130	83,120	21.6	1,018	0.3	3,84,549
1911-12	3,19,933	71.5	139	1,26,075	28.2	1,200	0.3	4,47,208
1916-17	2,93,535	69.7	127	1,26,935	30.2	348	0.1	4,20,818
1921-22	7,16,745	81.6	311	1,60,036	18.2	975	0.2	8,77,756
1926-27	9,53,619	84.6	413	1,70,413	15.1	3,204	0.3	11,27,236
1931-32	7,17,641	55.3	311	3,90,013	30.0	190,381	14.7	12,98,035
1936-37	8,80,709	62.3	382	4,41,133	31.5	76,347	6.2	13,98,189

(Includes figures for total expenditure on Calcutta Medical College)

Source: Quinquennial Reviews on the Progress of Education in India (Relevant years)

Figure II

TOTAL EXPENDITURE ON MEDICAL EDUCATION IN BENGAL BY SOURCE



As a proportion of total expenditure, government sources declined steadily from 89.2 per cent in 1886-87 to 69.7 per cent in 1916-17. With the massive increase in post-war government expenditure, it rose again to 81.6 per cent in 1921-22 and 84.6 per cent in 1926-27. Thereafter, it fell back rapidly to 55.3 per cent in 1931-32, rising modestly to 62.3 per cent in 1936-37.

Expenditure drawn from fees rose more substantially over the whole period but the rate of increase accelerated after 1926-27.

Private sources of income did not represent a significant proportion of total expenditure until approximately 1930.

When we look at College and schools separately, we find that different trends emerge. Tables VI and VII give the separate figures for the College and the Medical schools, while Figures III and IV show the changes in expenditure from government sources and from fees. There are minor differences between the trends of government expenditure in the two areas but the most interesting changes were in expenditures from fees and in the relationship between expenditures from government sources and expenditures from fees. In the College, income from fees rose steadily from 1906-07 to 1921-22 and fell drastically between then and 1926-27, rising equally dramatically to 1931-32 and levelling off between then and 1936-37.

TABLE VI

EXPENDITURE ON CALCUTTA MEDICAL COLLEGE, by Sources (in Rupees)

	GOVERNMENT SOURCES			FEES			PRIVATE (other sources)			TOTAL AMOUNT (Rs.)
	AMOUNT (Rs.)	Rate of Increase	%	AMOUNT (Rs.)	Rate of Increase	%	AMOUNT (Rs.)	%	AMOUNT (Rs.)	
7	-	-	-	-	-	-	-	-	-	1,96,145
2	-	-	-	-	-	-	-	-	-	2,00,356
7	2,17,629	100	83.9	41,710	100	16.1	-	-	-	2,59,330
2	2,33,844	107	79.7	59,385	142	20.2	-	-	-	2,93,229
7	2,09,047	96	68.8	94,468	226	31.1	-	-	-	3,03,515
2	5,11,670	235	80.5	1,23,179	295	19.4	-	-	-	6,34,849
7	4,40,295)	349	97.9	9,000)	70	2.0	-	-	-	4,49,295)
f Trop.Med. ene, Cal.	3,19,913)		94.0	20,270)		5.9	-	-	-	3,40,183)
2	5,12,811	235	63.5	1,39,194	334	17.2	1,54,675	19.7	-	8,06,680
des both)										
7	5,51,804	253	77.2	1,34,766	323	18.8	28,310	3.9	-	7,14,880

(Nos. rounded off on the Graph)

n addition, Belgachia Medical College at Calcutta was granted government aid in 1916 when it had 554 scholars
ith a total expenditure of Rs. 94,941.

TABLE VII

Expenditure on Medical Schools in Bengal, by Sources (in Rupees)

	GOVERNMENT SOURCES		FEES		PRIVATE SOURCES		TOTAL
	AMOUNT (Rs)	Rate of Increase	%	AMOUNT (Rs)	Rate of Increase	%	AMOUNT (Rs)
1896-97							* 1,28,810
1901-02	49,008	(100)	57.9	19,938	(100)	23.5	84,568
1906-07	82,791	168	66.1	41,410	208	33.0	1,25,219
1911-12	86,089	175	55.9	66,690	335	43.3	1,53,979
1916-17	84,488	172	72.02	32,467	163	27.6	1,17,303
1921-22	2,05,075	418	84.4	36,857	185	15.1	2,42,907
1926-27	1,93,411	394	57.2	1,41,143	709	41.7	3,37,758
1931-32	2,04,830	417	41.6	2,50,819	1260	51.04	4,91,355
1936-37	3,28,905	671	48.1	3,06,367	1539	44.8	6,83,309

* Total expenditure on Medical Institutions in Bengal for 1896-97 = Rs 3,24,955 (a)

Expenditure on Calcutta Medical College for 1896-97 = Rs 1,96,145 (b)

Therefore Expenditure on Medical Schools = a - b

= Rs 1,28,810

Sources: Quinquennial Reviews on the Progress of Education in India (Relevant years); Moral and Material Progress in India)

INDEX, 1906-7 = 100

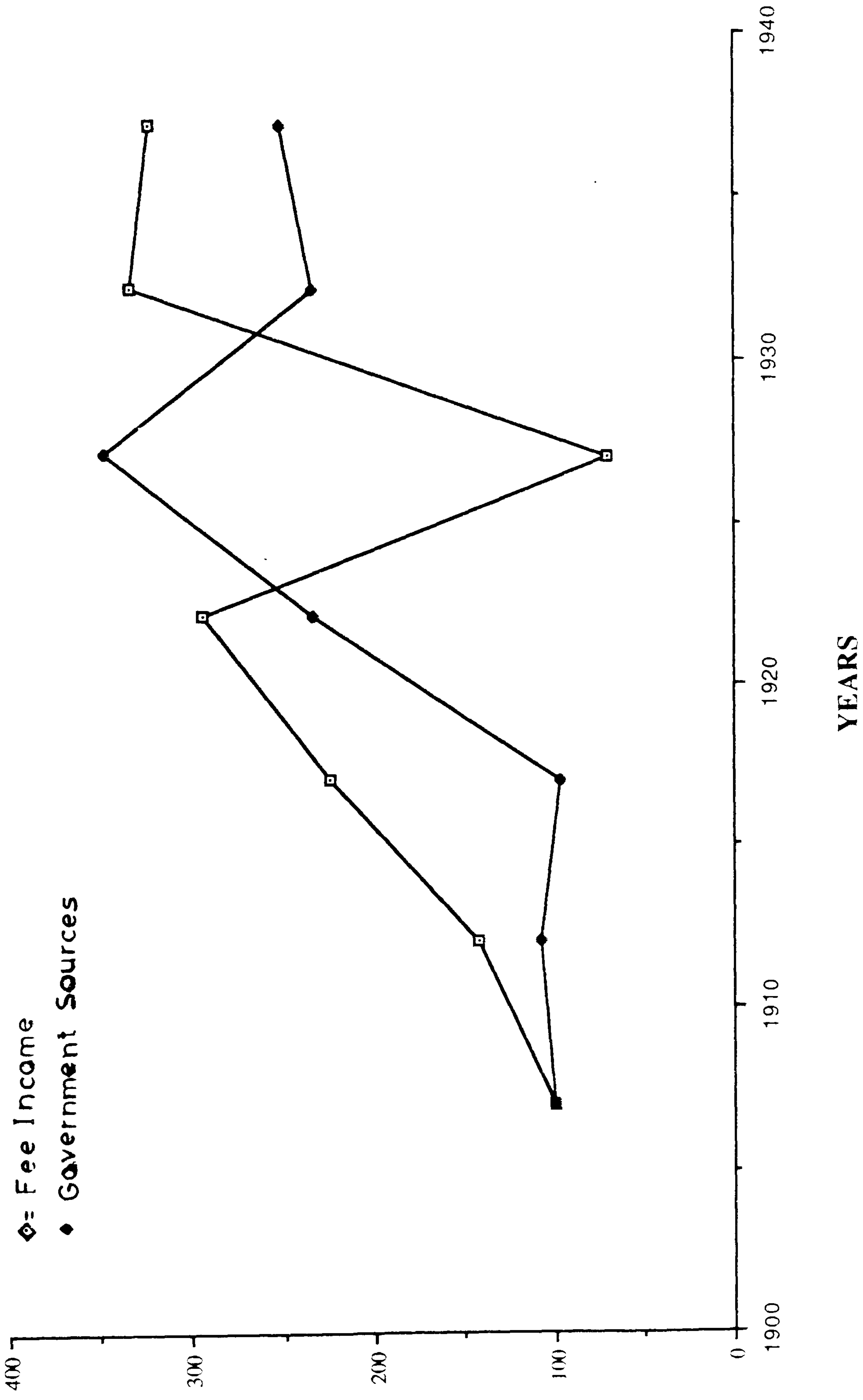
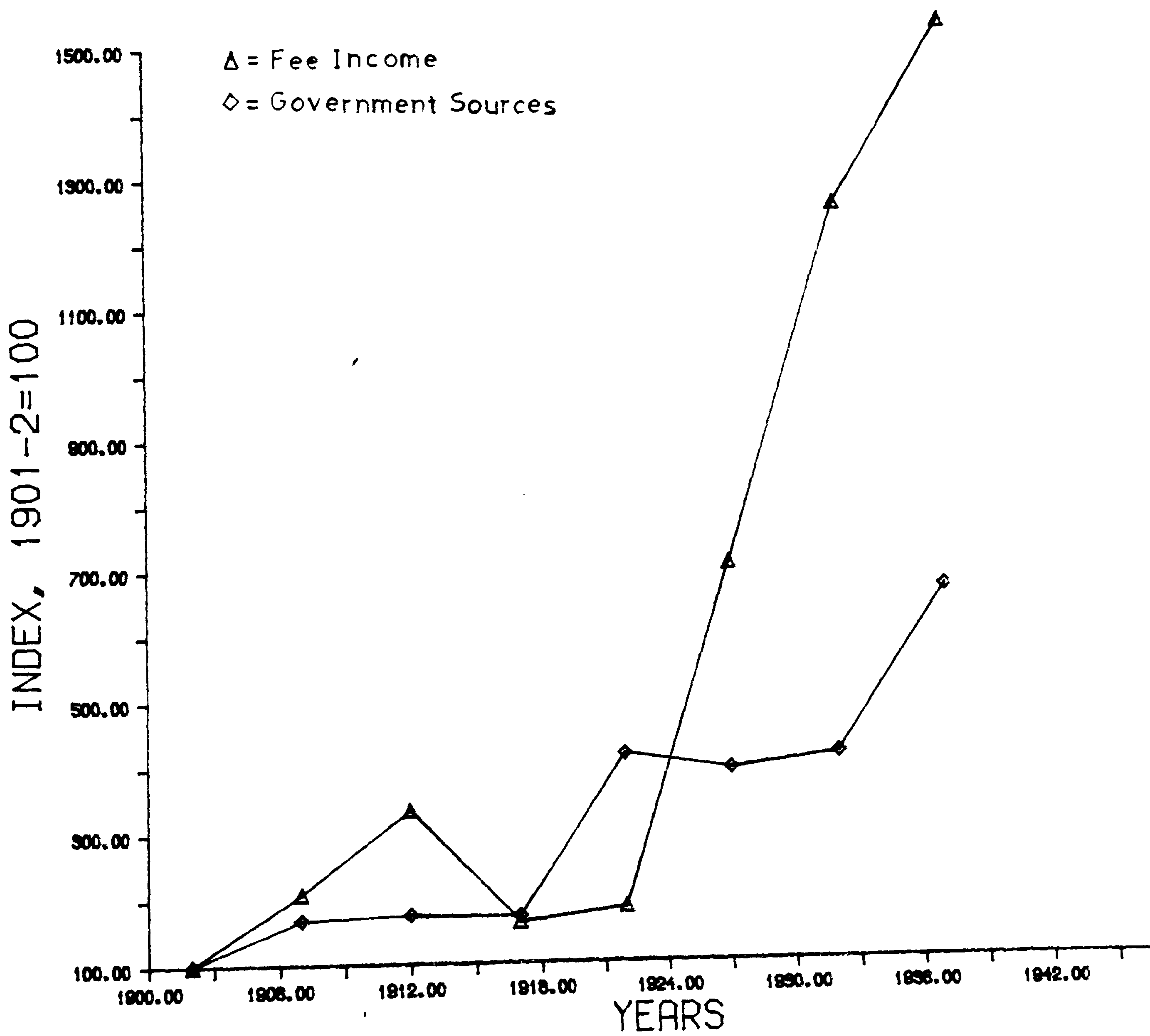


FIGURE III
EXPENDITURE ON CALCUTTA MEDICAL COLLEGE - GOVERNMENT AND FEES

FIGURE IV
EXPENDITURE ON MEDICAL SCHOOLS IN BENGAL - GOVERNMENT AND FEES

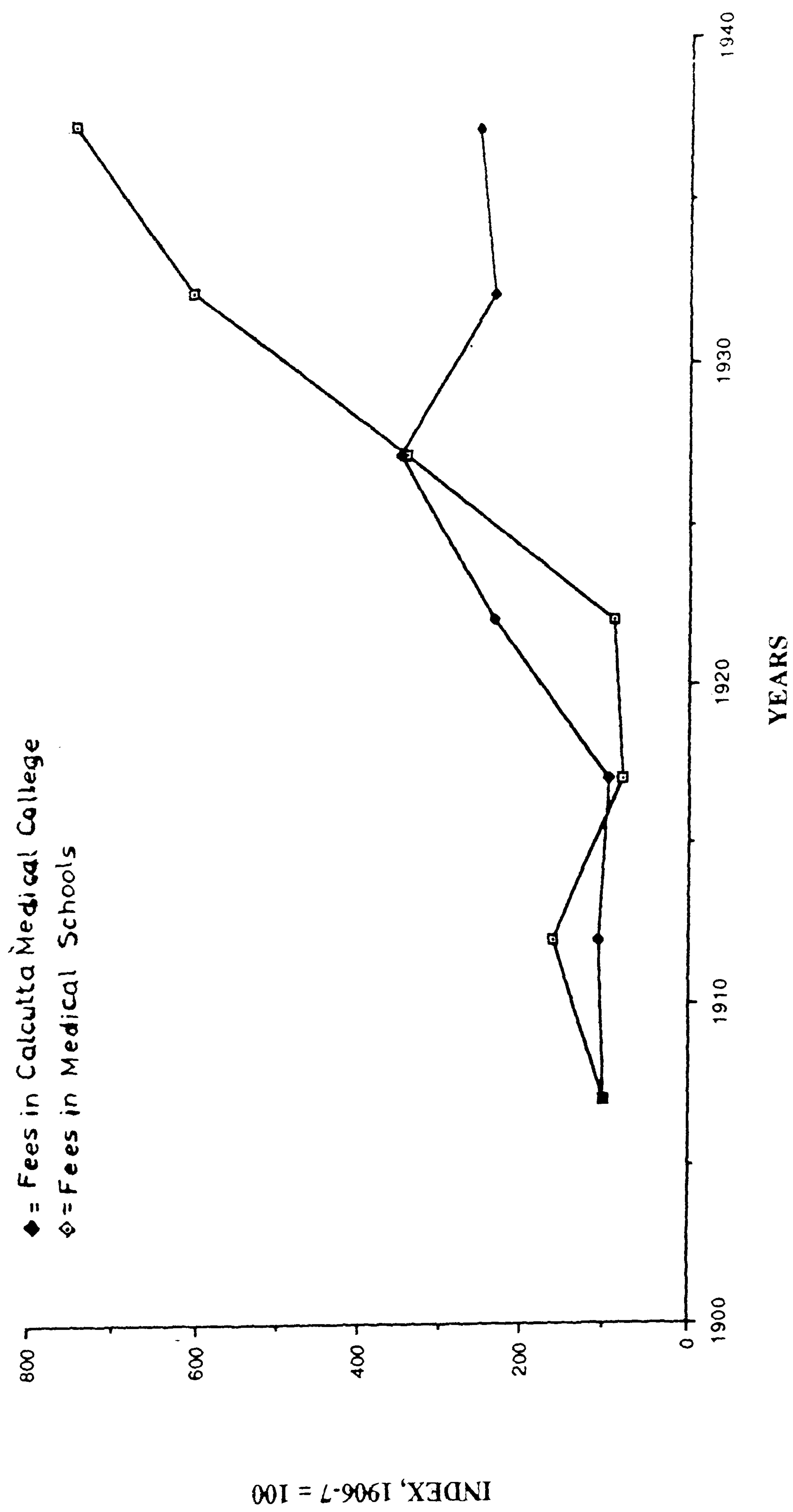


The fall in fee-income in the College coincides with the rise in government expenditure to its highest level. In the schools, fee-income fell at an earlier period between 1922-12 and 1916-17 and shows its most dramatic rise in the period when the College fees were falling. These trends are shown in Figure V. Unfortunately, separate figures for each are not available for the whole period. Figures on the different sources are available for the medical schools from 1901-02, and for the Calcutta Medical College from 1906-07. The earliest point when they can be compared then is 1906-07. In that year, income from fees in the two areas was very similar but while fee income represented 33.0 per cent of total income in the medical schools, it represented only 16.1 per cent at the Medical College. With the exception of the years 1916-17 and 1921-22, fee income was a larger proportion of total expenditure in the schools over the whole period. From these various data, it is clear that there are important issues affecting medical education in the period from approximately the beginning of the First World War to the late 1920s.

An official explanation of the dramatic rise in government expenditure on medical education immediately following the First World War was that the War had had such an unfortunate effect on the economic condition in India that it

"necessitated a general revision of the pay of the teaching staff which absorbed the funds available for medical expansion".⁴⁶

FIGURE V
EXPENDITURE ON MEDICAL EDUCATION IN BENGAL - FROM FEES IN CALCUTTA
MEDICAL COLLEGE AND IN MEDICAL SCHOOLS.



A further consequence of the rise in prices, it was argued, was that

"it resulted directly in the withdrawal of a considerable number of pupils whose parents could no longer afford to keep them at school".⁴⁷

In so far as these factors affected medical education, their impact was on the schools rather than the College. The cost per student at Medical College rose by approximately 29 per cent between 1911-12 and 1921-22, but the equivalent figure for schools was 107 per cent. Over the same period, the number of medical schools fell from 7 to 5 and the number of students rose only from 1848 to 1915 [Table VIII]. It should be noted, however, that a large fall in pupils occurred between 1911-12 and 1916-17, when the rise in cost per student was much more modest.

In the College, the number of students continued to rise steadily and the increase from 612 in 1911-12 to 1030 in 1921-22 represents 68 per cent. It would seem that in the College at least, the increase in expenditure cannot be fully explained by increasing costs. As we have seen, fee expenditure continued to rise over the period. While the cost per student rose 29 per cent, fee-income rose 107 per cent. The increased government expenditure was not required to compensate for a loss of fee-income.

TABLE VIII

Number of students in Calcutta Medical College
and Medical Schools in Bengal (1866-67 to 1936-37)

Year	CALCUTTA MEDICAL COLLEGE		MEDICAL SCHOOLS		
	No. of students	Standardised increase	No. of schools	No. of students	Standardised increase
1866-67	139	(100)	-	278	(100)
1876-77	176	127	-	862	310
1886-87	172	124	9	793	285
1891-92	255	183	9	1035	372
1901-02	595	428	9	1316	473
1906-07	425	306	7	1285	462
1911-12	612	440)	7	1848	665)
1916-17	902	649)	9	1119	403)
1921-22	1030	741)	5	1915	509)
1926-27*	1018	732)	10	2282	821)
1931-32*	739	532)	9	2418	870)
1936-37*	771	555)	9	2409	867)

Sources: Quinquennial Reviews on the Progress of Education in India (Relevant Years); Moral and Material Progress Report 1876-7.

* Figures include Calcutta Medical College and School of Tropical Medicine and Hygiene; figures for schools also include students in Private schools.

In the schools, there would appear to be more force to such an argument. While the cost per student rose by 107 per cent, fee-income fell by 45 per cent. Once again, however, as with numbers of students, the fall in fee-income was greater between 1911-12 and 1916-17.

It would appear that this was a crucial period for the professionalisation of medical education. During the First World War and the period immediately thereafter, the schools suffered something of a decline. The Calcutta Medical College grew rapidly at this time, largely supported by an increase in fee-paying students. Considering the inordinate costs involved in medical education at the College, it seems plausible that these students came from the affluent sections of the Bengali society. The Bhadraklok founded the R.G. Kar Medical College, also called Belgachia or Carmichael Medical College, in the year 1916. This evidently represented the first institution which viably ran, entirely by private donations.⁴⁸ The College was affiliated to the Calcutta University in 1917 and from then on included post-graduate medical studies too. While the number of students rose so did the problem of standards of entrance and of instruction. This problem was seen in the suspension of medical degrees by the G.M.C. [discussed in Chapter IV]. This followed Needham's report on the state of medical education in India which highlighted the defects in the Indian medical curriculum. And in order to ensure better

standards in medical education, the G.M.C. imposed restrictions on the intake of students in medicine. In this confused atmosphere, it would appear that fee-paying students moved either to existing schools or to new foundations. Fee-income at the College plummeted while at the same time the schools received a massive boost. Figure V shows how fees in medical schools took off in the 1920s. At this time, the cost per student in the Medical College was more than five times the average in medical schools. It would seem that the wealthier sections of the community did not regard the higher costs as justified when attached to an unrecognised qualification. With the re-establishment of recognition, or more accurately in anticipation of it, there was a return of fee-paying students to the College. By this time, however, the growth in medical schools was well-established.

From the 1920s onwards they never looked back. Given the conditions in India and the competition with indigenous medicine, it was unlikely that professionalisation could ever have been established upon the basis of a monopoly of British-recognised practitioners, but the boost the schools received ensured that the practice of western medicine in India would be professionalised, if at all, on a much lower level of qualification.

So far we have concentrated on the financing of medical education in Bengal. But the issues raised can also be illustrated in changes in the numbers of students and the numbers of approved institutions. Table VIII^{and Figure VI} show these figures for the period from 1866-67 to 1936-37. The figures for the Medical College show a modest rise until 1891-92, a rapid rise from then to 1901-02, and then a fall to 1906-07. This fall corresponds with the nationalist agitation of 1905. Thereafter, the rise continued at an increased rate until the mid-1920s, then a fall in numbers corresponding to the fall in fee-income that we noted earlier occurs. In the 1930s, a modest rise is re-established. The pattern in the schools also followed the trends already discussed. A similar, though less marked, fall occurs between 1901-02 and 1906-07. But a much more substantial fall occurs between 1911-12 and 1916-17. Though the number of schools falls between 1916-17 and 1921-22, there is a rise in the number of pupils. The biggest change for the schools occurs between then and 1926-27. The number of schools rises from 5 to 10 and there is a correspondingly large increase in the number of students. These changes are consistent with the movements of fee-income between the College and the schools. The schools increase further to 1931-32 and maintain that level to 1936-37.

The extent to which the movement between the College and the schools was associated with privileged Hindus can be seen in Table IX. In 1924-25, before de-registration, there were 1,003 Hindus and

Figure VI

STUDENTS IN CALCUTTA MEDICAL COLLEGE AND BENGAL MEDICAL SCHOOLS

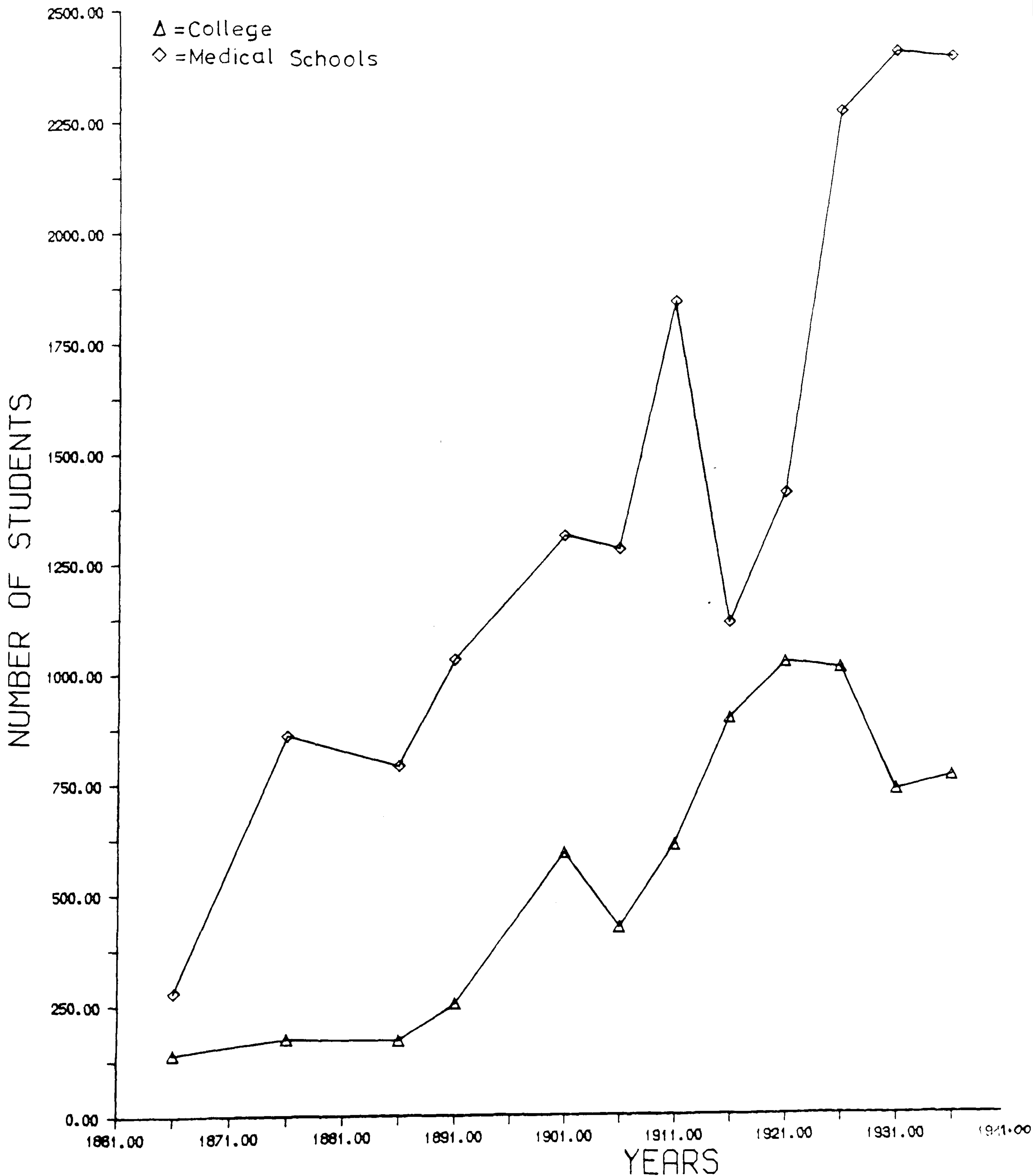


TABLE IX-

Statement showing the classification of students according to religion and Nationality taught at Calcutta Medical College.

Year	ETHNIC BACKGROUND					
	Europeans & Eurasians	Native Christians	Hindus	Mohammadans	Buddhists	Parsees
1923-24	14	9	1,004	138	12	3
24-25	13	9	1,003	157	12	2
25-26	13	4	604	156	10	2
26-27	10	7	828	148	7	1
27-28	9	7	770	151	6	1
28-29	9	8	724	142	5	1
29-30	5	7	638	144	1	1
30-31	3	6	600	135	1	1
31-32	3	7	597	118	1	1
32-33	4	7	599	103	-	4
33-34	4	5	599	99	-	6
34-35	-	-	-	-	-	-
35-36	7	3	619	77	-	6
36-37	3	4	637	74	-	6

Source: Annual Report of the Medical College, Calcutta (relevant years)

157 Muslims. In the following year, after de-registration, there were 604 Hindus and 156 Muslims. Though the number of Hindus had increased to 838 by 1926-27, we know from the figures of fee-income that a very low percentage were paying fees. 1925-26 marked the point of lowest relative advantage of Hindus over Muslims in the Medical College. Thereafter, there is somewhat uneven but definite trend towards the advantage of Hindus.

Table X shows the relative advantage of Hindus over Muslims from 1881-2 to 1936-37. Unfortunately, there are no data available between 1891-92 and 1921-22. The figures in the Table are odds ratios of the proportion of Hindus to Muslims in the Medical College and in the medical schools by the proportions of Hindus to Muslims in the population in general. The advantage of Hindus in the College is very considerable over the whole period. In 1881-82, there were no Muslims at the Medical College. And at the end of the period 1936-37, Hindus were eleven times more likely to receive College education. The estimates of advantage in the College vary in different sources. In order to maintain a comparability with figures for the schools, odds ratios derived from Quinquennial Reviews are given in brackets for the College. The period of least advantage to Hindus was, as we noted, 1925-26. By 1936-37, their advantage was back to the levels of the nineteenth century and 1921-22.

TABLE X

Hindus and Muslims in the Population in General and
in Western Medical Education in Bengal

ODDS RATIOS (O.R.)

<u>Year</u>	<u>Calcutta Medical College</u>	<u>Medical Schools</u>
1881-82	x ¹	1.12 ¹
1886-87	9.26 ¹	2.89 ¹
1891-92	12.66 ¹	2.51 ¹
1921-22	- (11.74) ³	7.15 ³
1923-24	8.87 ²	-
1925-26	4.96 ²	- ³
1926-27	6.91 ² (7.28) ³	3.95 ³
1931-32	6.32 ² (7.37) ³	9.18 ³
1936-37	11.04 ² (11.01) ³	12.27 ³

Note: 1, 2, 3 show the variation in figures according to different sources as listed below.

- 1 From Bengal Administration Reports
- 2 From Annual Report of the Calcutta Medical College
- 3 From Quinquennial Reviews on the Progress of Education

$$\text{O.R.} = \frac{\text{No. of Hindus at College/Schools}}{\text{No. of Muslims at College/Schools}} \times \frac{\text{Population of Muslims}}{\text{Population of Hindus}}$$

In the schools, the changes were more pronounced. As we mentioned earlier, the advantage of Hindus in 1881-82 was slight. Overall, it had grown considerably by 1891-92, but by the time of the next available figures, 1921-22, the growth of advantage had been even more marked. As with the College, the trend to advance minority interests in the 1920s led to a decline in the level of advantage, but once again it moved ahead rapidly in the 1930s until 1936-37 when Hindus were more than twelve times as likely as Muslims to be in medical schools.

The advantages of Hindus over Muslims in western medical education are, therefore, very marked. These two groups comprise the vast majority of the population of Bengal during the nineteenth and twentieth centuries. Depending upon the changes of boundaries, first Hindus and later Muslims formed a larger part of the community but in all circumstances, Hindus had a closer relationship to English education and to the English authorities.

While western medical education was restricted to government employment, Hindus sought an advantage only in terms of the higher levels of appointment associated with training at Calcutta Medical College. When western medical education became a valuable resource in the community in general, they moved into the medical schools. Their growing advantage in this areas was reinforced by entry

requirements and instruction associated with competence in English which was concentrated in the Hindu section of the community. Within the Hindu community, western education was closely associated with privileged castes which came to be known as the Bhadrak.

There were efforts at various times, especially after the First World War, to move resources towards less privileged groups. Despite some initial success, the privileged sections of the Hindu population managed to re-establish and even advance their level of privilege.

In earlier chapters, we have seen that the twentieth century brought efforts both to change indigenous medicine and to make accommodations between it and western medicine. Given the dominance of Hindus in western medical education, it is not surprising that the form of indigenous medicine most involved in this process was Ayurvedic rather than Unani.

F O O T N O T E S, Chapter VI

1. N.K. Sinha cited by N. Gray, "Bengal and Britain: Culture Contact and the Reinterpretation of Hinduism in the Nineteenth Century" in R.V.M. Baumer (ed.), Aspects of Bengali History and Society, 1976, New Delhi, pp.99-131; p.104.
2. J.H. Broomfield quoted by D. Kopf, "A Bibliographic Essay on Bengal Studies in the U.S." in Baumer (ed.), ibid., pp.200-243; p.213.
3. J.H. Broomfield, Elite Conflict in a Plural Society: Twentieth-Century Bengal, 1968, Bombay, Oxford University Press, p.7.
4. Ibid.
5. Ibid.
6. Ibid.
7. Ibid.
8. Ibid. No details on their number.
9. B.V. Subbarayappa, "Western Science in India up to the end of the Nineteenth Century" in D.M. Bose (ed.) A Concise History, op.cit. pp.484-567; p.546.
10. Memorandum on the Progress of Education in India, 1916 and 1926, 1928. See also Subbarayappa, ibid.
11. Selections from Educational Records, 1854, Calcutta.
12. Ibid.
13. Ibid.
14. P.L. Rawat, History of Indian Education, 1968, Agra, Ram Prasad, p.165.
15. S. Mahmood, A History of English Education in India, 1895, Aligarh, p.80.
16. Desai, op.cit., p.147.
17. Members of the Committee included Trevelyan, Sir Erskine Perry, Marshman, Alexander Duff, H.H. Wilson, Cameron, Sir Frederick Halliday. See also Rawat, op.cit.
18. R. Jeffery, Ph.D. Thesis, 1985, op.cit., p.110.

19. Mahmood, op.cit. See also Memorandum, 1928.
20. The power to confer degrees in medicine was granted under the Act of 1860.
21. Rawat, op.cit.
22. B. Kling cited by Gray in Baumer (ed.), op.cit., p.130.
23. B.S. Choudhary cited by Gray in Baumer (ed.), ibid., p.119.
24. Ibid.
25. McGuire, op.cit., p.44.
26. Broomfield, op.cit.
27. New Calcutta Directory for 1857, 1857, Calcutta. See also J. McGuire, The Making of a Colonial Mind: A Quantitative Study of the Bhadraklok in Calcutta: 1857-1885, 1983, ANU.
28. Gray in Baumer (ed.), op.cit.
29. Rawat, op.cit.
30. Desai op.cit.
31. A. Basu, The Growth of Education and Political Development in India, 1898-1920, 1974, Delhi, Oxford University Press, p.16.
32. Broomfield, 1968, op.cit.
33. See also McGuire, op.cit., p.57.
34. Basu, op.cit.
35. Census of India, 1921, Vol.V, pt.I.
36. B.B. Misra, The Indian Middle Classes: their growth in modern times, 1961, London, Oxford University Press.
37. Report on the Administration of Bengal, op.cit.
38. Rawat, op.cit., p.211.
39. Basu, op.cit.
40. Rawat, op.cit.
41. Desai, op.cit., pp.397-98.

42. Quinquennial Review on the Progress of Education in India, 1917-22, pp.25-26.
43. See S.N. Banerjea, A Native in the Making, 1925, London, p.36. See also Hundred Years, op.cit.
44. D. Kopf, British Orientalism and the Bengal Renaissance, 1969, Berkeley, pp.56-62. See also S.C. Sanial, "History of the Press in India", Cal.Rev., 1963, CXXXII, p.263.
45. McGuire, op.cit., p.57.
46. Quinquennial Review, op.cit., p.14.
47. Ibid.
48. S.C. Seal, "History of Medical Education in India", Ind.J.Pub.Hlth., Oct. 1956, 1 (1) pp.37-67; p.53.

C H A P T E R V I I

CONCLUSION

In setting the problem, I showed how indigenous medicine moved through periods of scientific curiosity, consolidation and routine application. At the beginning of the period of study, it had settled down to an unquestioning technology. Chattopadhyaya contends that this lowering of scientific standards was because religious orthodoxy attacked medical science for believing in materialism, empirical demonstration and so forth. This may be true, but the only evidence Chattopadhyaya brings in favour of this point of view is the attack in the Yajurvedas on the twin Asvins - the physician-gods. However, for his argument to hold, even within the theoretical structure of Chattopadhyaya's work, he would need to demonstrate that the religious attack on the Ayurveda was supported by the State. But we have no evidence of this in ancient India. On the contrary, some of the great Ayurvedic practitioners, whose reputation had reached mythical proportions, were patronised by royal courts right down to late ancient period.

The pragmatism of developing medical systems represented a challenge to the priestly authorities of, for example, the Brahmins, and the religious attacks are probably best seen as attempts to resist a potential destabilisation of a socio-political hierarchy.

And when medical practice could not be resisted, there were attempts to appropriate it and present it within a religious format. This process led to a curious accommodation within Hindu texts of medical practices which were otherwise against religious observances. It would seem that the force of medical styles required an accommodation on the part of religious authorities seeking to maintain social and political advantage. And the impact of religion upon medicine may not have been as restrictive as is usually claimed. However, at the beginning of the period of study, Ayurvedic exponents were known and celebrated far and wide not for their discoveries but for their compilation. The discoveries of Indian medicine are not attributed to particular medical authorities. Not a single authority in ancient and medieval times is ever credited with any worthwhile discovery. Practitioners were canonised for their extensive sweep of their redaction and compilation. This was made possible by the close connection between medical men and the State and the complete dependence of the most successful on the largesse of the royal authorities. The practical achievements of medicine are absorbed in the texts but the process by which they come to be known is not represented within these texts. It is not possible for either the State or for religious orthodoxy to "banish" a technology which is eminently practical. If a science or technology yields results which meet human felt-needs, it is likely to flourish. Indeed, rulers in the ancient and medieval periods sought out the best practitioners of new medical systems. With a dependable clientele-base, thus, indigenous

medicine flourished and brought encomiums to many of its practitioners.

With the British rule in India, indigenous medicine for the first time probably lacked, or at least seemed to lack, official patronage. But the British were not responsible for the stagnation of indigenous medicine. For hundreds of years prior to British rule, and with State patronage, indigenous medicine remained comatose. Nonetheless, at the beginning of the period, the basis of indigenous medicine was not greatly dissimilar to that of western medicine which did not possess many vastly superior forms of treatments. However, western medicine had much more practical and enquiring orientation, also marked by the changes occurring in diagnosis, nosology, pathology, and most important of all, anatomy and surgery. In the late nineteenth-century, when medicine made significant strides, both in clinical medicine, and slightly later, in the handling of epidemics, in India, the divergence of Indian and Western medicine accelerated. Those aspects of indigenous medicine that might be of more general value, were not exhausted. The nationalist movement, in calling for the regeneration of indigenous forms of medicine, accepted that to compete they would require research and improvement in knowledge and practice. There were pressures, therefore, to take indigenous medicine out of its passive state of routine and rituals.

In both India and Britain, the State played crucial roles in the development of medicine. But the roles in the two contexts were rather different. In Britain, State priorities were much more extensive, while in India, the British State had a much more limited perspective with respect to medicine. Western medicine was introduced in India as part of the bureaucratic machinery, whereas in Britain it was part of a social and economic movement.

In India, the British authorities provided services for the Army, and when services were extended over a wider range, they were carried out under the supervision of Army personnel. Western medicine, thus, remained largely a metropolitan affair and western medical education developed in the Bengal Presidency, primarily to train hospital assistants for military and civil hospitals.¹ When the authorities extended their concern to cover public health, they were not able, initially, to repeat the spectacular successes obtained in nineteenth-century Britain. Thus the impact of western medicine on the indigenous population was relatively slight until well into the twentieth-century.

The limited medical objectives of the British state had a crucial influence upon the extent of professionalisation of medicine in India. Western medicine could never be offered the monopoly it was gaining in Britain, since there was no extended system of training which would deliver it to the majority of the population. Indeed, in these circumstances, when the State did promote medical

education, it was frequently at a level below that required in Britain. When western medicine was extended to cover sections of the indigenous population, it was carried out by practitioners with limited and specific training. Western medicine was advantaged by its relation to the British State which gave it a monopoly of practice in certain areas, but the limited nature of State objectives undercut the movement for professionalisation, and the State itself diluted the medical profession in an important way. By the end of the period of study, medical schools set up, initially, by the British authorities to meet their specific needs, produced more practitioners trained in western medicine than did the Medical College, the training of which met the requirement of the British profession.

In both the schools and the College, aspects of indigenous medicine were taught alongside aspects of western medicine. The course of development of medicine in India was different from that in Britain, and it cannot be represented purely as a struggle between different systems. Throughout the period, there were accommodations and that process continues to the present day.

From our findings, we feel that an intensive study can now be done on how indigenous medicine in modern times has reacted to the support it has received from various quarters and how people, faced by medical problems have, in turn, reacted to the various turns that the Ayurveda and Unani have taken. It is possible

that some fresh light can be thrown on the dynamics of medical science and on the interaction between medical science, State and society.

FOOTNOTE, Chapter VII

1. See also Ramasubban, op.cit.

APPENDIX I

CLASSIFICATION OF MEDICAL PRACTITIONERS IN ANCIENT, MEDIEVAL, AND BRITISH PERIODS IN INDIA

ANCIENT INDIA

1. Brahmins practising medicine according to the Vedas, except the practical and surgical basis of the Ayurveda.

2. Baidyas (or Ambasthas of Manu) practising medicine according to the Ayurveda.

1. Brahmins as in ancient India, accommodating Unani practices.

2. Baidyas (or Ambasthas) practising Ayurveda and Unani medicine.

3. Hakeems of Unani medicine practising Unani, initially, and both Ayurveda and Unani in late medieval period.

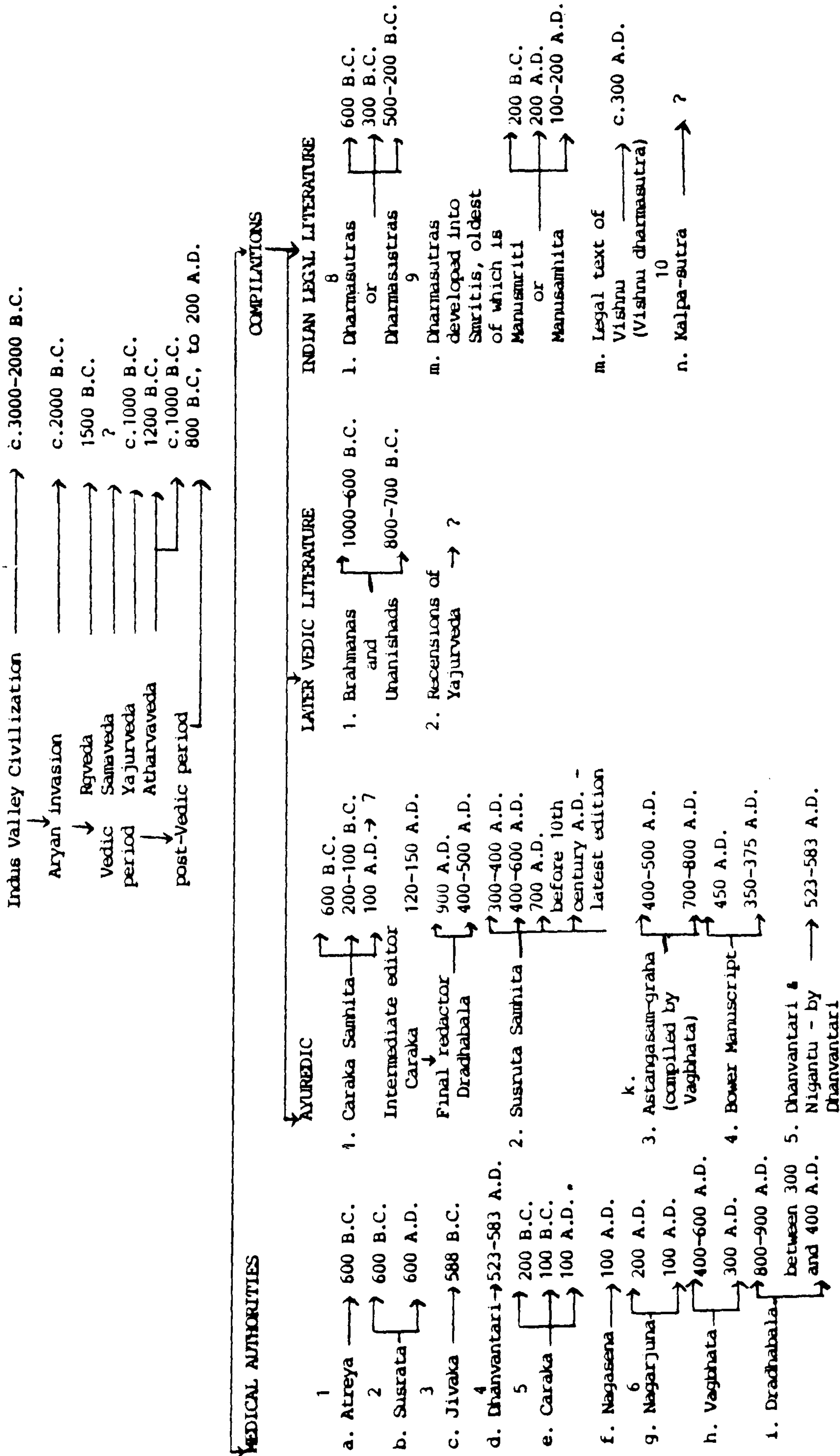
MEDIEVAL INDIA

BRITISH INDIA

1. <u>Brahmins</u> practising western medicine.	2. <u>Orthodox Brahmins (as in early periods)</u> practising traditional Vedic medicine.	3. <u>Baidyas</u> in western medicine.	<u>Kayasthas</u> in western medicine.	<u>Western men</u> in western medicine.	no information on Hakeems, but likely to continue practising indigenous and western medicine.
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APPENDIX II

CHRONOLOGY CHART TO SHOW THE DATES OF EXISTENCE OF MEDICAL AUTHORITIES AND THEIR WORKS IN ANCIENT INDIA



Key to Letters used in the Chronology Chart:

1. Taught medicine at Taxila University
2. Surgeon at Banares
3. Atreya's pupil; a physician and surgeon and a contemporary of Buddha, physician to king Bimbisara
4. Physician to king Vikramaditya
5. Court physician to king Kanishka
6. Most commonly accepted date for its composition
7. Law-codes of the earliest group of Indian law-givers - Apastamba, Gautama and Vasistha
8. Many Dharmasutras formed part of this class of literature - included priestly manuals concerning rules and regulations regarding ritual techniques
9. An authoritative compilation of the Ayurvedic knowledge based on earlier works; rendered into Arabic under the title 'Astankar'.
- 10.

APPENDIX III

GRECO-ARAB (UNANI) MEDICAL WORKS OF MEDIEVAL INDIA

PERIOD	IMPORTANT COMPILATIONS	COMPILER/AUTHOR	CONTENTS OF THE COMPILATION
A. Reign of Altamish (c.1221 A.D.)	1. Translation of Al-binuni's Kitab-al-Saidana (first medical book on Greco-Arab medicine) 2. Other medical works (names not known)	Abu Bakir bin Ali bin Uthman Badral-Din Dimashi Sadr al-Din Tabib Alaal-Din	Written in India
B. Khilji period (1296-1321 A.D.)	1. Majmua-i-Shamsi 2. Majmua-i-Mohammadi 3. Risala-al-Firuz Shahi	Shams-ul-din-Mustaufi Mohammad Shah Quli	Written in Persian with the help of Sanskrit books of Indian physicians
C. Tughlaq Dynasty a. Mohammad bin Tughlaq (1325-1352 A.D.) b. Firoz Tughlaq (1352-1388 A.D.)	1. Majmua-i-Ziaa 2. Majmua-i-Diyaiyya 3. Kitab-fil-Sanna at al-Tibbiya) 4. Kitab-al-Kulliyat wa-Juziyat) 1. Tibbe-Firoz Shahi 2. Kuhle-Firoz Shahi	Ziya Muhammed Murerak Hakim Diya Muhammed Ziya-ud-din Bakshi Dictated by Firoz Tughlaq Firoz Tughlaq	Based on Arabic and Ayurvedic works First known translation of an Indian medical text into Persian
D. Provincial rule Mahmud Shah (1458-1510)	1. Shifa-i-Mahmud Vagbhata 2. Tibb-Shifai-Mahmudi 3. Tarikh-e-Ibn-e Khalikan) 4. Mishkai-Sharif) 5. Translation of other Ayurvedic works of Vagbhata)	Ali bin Mohammad bin Ismail Usawli Usaili Mahmud Shah Not known	Translation of a book of Vagbhata into Persian; a collection of 8 Ayurvedic books; deals with children's diseases, evil effects of ghosts, wounds caused by arrows and thorns, treatment for bites by poisonous animals, treatment to restore virility. Translation of Ayurvedic works into Persian
E. Mughal Dynasty 1. Babur's reign (1526-1530) 2. Humayun's reign (1530-1555 A.D.) 3. Akbar's* reign (1556-1605 A.D.)	1. Jami-ul-Fawaid) 2. Qaisda-fi-Hifz-ul-Sihhat) 3. Dastur-ul-Fasd 4. Other medical works (titles not known?) 1. Several manuscripts (titles not known) 2. Humayuni 1. Fawaid-al-Insan 2. Ain-i-Akbar 3. Mizan-al-Tibb 4. Other medical works (titles not known)	Hakim Yusuf bin Muhammad Hakim Muhammad Beg Mir Khalifa Mohammad Beg and Yusuf bin Mohammad Maulana Muhammad Fazl Hakim Dawai do. Muhammad Akbar Arzani Hakim Ali Gilani, Kavi Chandra, Vidyaraja	First book on integrated medicine - Greco-Arab and Ayurveda - - - Dedicated to the Emperor -

* Names of some of the physicians in Akbar's Court:

1. Mulla Abd al-Qadir
2. Fathallah Shirazi
3. Hakim Ali Gilani
4. Mulla Ahmad
5. Khwaja Nizam al-Din
6. Shaikh Faidi
7. Abd al-Rahim Khan-i Khanan
8. Hakim Dawai
9. Abul-Fadl.

PERIOD	IMPORTANT COMPILATIONS	COMPILER/AUTHOR	CONTENTS OF THE COMPILATION
E. Mughal Dynasty (contd.)			
4. Jahangir's reign (1605-1627 A.D.)	1. A medical work (title not known)	Hakim Ruhuallah	Translation of an Ayurvedic treatise on hygiene
	2. Another medical compilation (title not known)	Hakim Sadra	-
	3. Um al-Ilaj	Hakim Amanallah Khan bin Mahabat Ali Khan	Rules for purging
	4. Ganj Bad Awurd	-do-	Indian drugs; voluminous work on tested prescriptions and practices of all the well-known physicians right from the inception of this system down to his own age.
	5. Dastur-el-Hunud	-do-	Persian translation of the Vedic medical work, <u>Madan Vinod</u> .
5. Shah Jahan's reign (1627-1658 A.D.)	1. A medical treatise	Hakim Abdullah	Treatise on the achievements of Unani and Indian physicians during the emperor's rule
	2. A medical work	Hakim Amanullah Khan	-
	3. Afaz al-adwiya	Hakim Nur al-Din Abadillah Ain al-Mulk Shirazi	Medicines
	4. Jami al-attiba	-do-	Treatment
	5. Sabab-i sitta Rashidi	-do-	Hygiene
6. Prince Dara Shikoh	1. Illaj-i Dara Shikohi	-do-	Treatment and Hygiene; a medical compendium containing the collective knowledge available up to the period of its author; states the cause and symptoms of each disease and author's personal experience and views; a mixture of Unani and Vedic medicine; a valuable material presented on hygiene, anatomy, diseases of children, principles of treatment, alchemy.
	2. A medical work	-do-	-
7. Aurangzeb's reign (1658-1707 A.D.)	1. Tuhfat-ul-Alibba)		
	2. Riyaz-e Alamgiri)	Mohammad Akbar bin	-
	3. Tibbe-Nabavi)	Mohammad Maqim Arzani	
	4. Tibbe-Hindi)		
	5. Tibbe-Aurangzebi	Darwish Muhammad Hakim Aimanabadi	Treatment
	6. Mujarrab al-Shifa	Hakim Ahmad bin Muhammad Multani	Treatment
	7. Riyad-i Alamgiri	Muhammad Rada al- Mutatabbib	Art of medicine
	8. Riyad al-fawaid	Aman bin Muhammad Afdal bin Muhammad Arif bin Muhammad	Treatment (entirely based on Ayurvedic sources)
	9. Tadhkirat al-hukma	Ismail bin Ibrahim Tabrizi	History of Medicine
	10. Mirzan al-tibb	Hakim Muhammad Akbar bin Muhammad Muqim Arzani	Principles of medicine
	11. Mufarraah al-qutub	-do-	Art of medicine
	12. Tibb-i Akbari	-do-	Treatment
	13. Hudud al-amrad	-do-	Principles of medicine
	14. Mujarribat-i Akbari	-do-	Treatment
	15. Ain al-hayat	Hakim Mubarak	Treatment
	16. Tibb-i Hamidi	Hakim Hamid	Treatment

GRECO-ARAB (UNANI) MEDICAL WORKS OF MEDIEVAL INDIA (contd.)

PERIOD	IMPORTANT COMPILATIONS	COMPILER/AUTHOR	CONTENTS OF THE COMPILATION
8. Muhammad Shah (1732-1762)	1. Tuhfa-i Muhammad Shah	Hakim Alawai Khan	Drugs
	2. Jami al-Jawami	-do-	Drugs
	3. Kitab al-nabat	-do-	Drugs
	4. Ahwal a-ada-al-nafs	-do-	Collection on chest diseases and their cure
	5. Kulasa qawanin al-ilaj	-do-	Treatment
	6. Sharh Mujiz al-Qanun	-do-	Art of medicine
	7. Asbab al-nishat	Ibn Ramdan Beg Mzaandrani	Sex
	8. Sharh-i Qanun	Shaikh Kalimallah Jahanbadi	Principles of Medicine
	9. Shiraj al-ilaj	Hakim Hidayatallah	Treatment
COMPILATION WORK GOES ON IN OTHER MUSLIM KINGDOMS AS WELL (18th century)			
9. Muhammad al-Mulk Nawab Amir Khan (1753)	Shifa al-qulub	Ahmad al-Tabib	Treatment
10. Daud Khan bin Khuda Yar Khan	Tibb-i Daudi	Mir Abd al-Razzaq	Treatment
11. Nawab Siroq al-Daula	1. Qanun ihdath-i Sikan dari	Hakim Iskandar bin Hakim Ismail Yunani	Treatment
	2. Qarab din Iskandari	-do-	Compound drugs
	3. Mufradat-i Iskandari	-do-	Drugs
12. Shah Rukh Baha-duran	Khawas-i jawahir	Ibn-al-Zai Muhammad Hajji	Drugs
13. Shah Alam Bahadur	1. Fawa'id-i mudaffi-tadbir-i chuf-mida	Radi Khan bin Qutb al-Din Khan	Treatment
	2. Risalafi hisat al-kulliw al-mathana	-do-	Treatment
14. Nizam Ali Khan Asif Jah	1. Tajribat-i Haidri	Khawajah Haidar Husain Khan	Treatment
	2. Tibb-i Mumtaz Arfi	Hakim Muhammad Arif Patni	Treatment
	3. Tahqiq al-buhran	Hakim Ahmadallah Khan	Principles of medicine
15. Nawab Wala Jah	Mujarribat-i Jamali	Jamal al-Din Madrasi	Treatment
16. Nawab Fadl Ali Khan	1. Muallijat-i Hindi	Hakim Shaikh Haidar Misri	Treatment
	2. Multaqat Daka-iya	Hakim Dhaka allah Khan	Compound drugs
17. Sikandar Jah	1. Pakaho Baikali	Daya Nath	-
	2. Dastur-i Am Sikandar Jahi	Hakim Safdar Ali Khan	Principles of medicine and diagnosis
	3. Yadgar Radai	Hakim Rada Ali Khan bin Hakim Muhammad Khan	Drugs

GRECO-ARAB (UNANI) MEDICAL WORKS OF MEDIEVAL INDIA (contd.)

PERIOD	IMPORTANT COMPILATIONS	COMPILER/AUTHOR	CONTENTS OF THE COMPILATION
18. Nasir al-Din Haider	Fawakih Shahi	Hakim Mir Shah Mirza Khan	-
19. Nawab Muntazim al-Daula	1. Fawa'id muntazima 2. Talkhis al-aqaqir 3. Khwas al-adwla 4. Risali Atishak 5. Kul al-absar 6. Hall al-mushkilat	Hakim Mir Insan Ali Hakim Ali Khan bin Hadratallah Muhammad Afdal Muhiballah ibn Muhammad Jilani Lal Chand Pandit Saiyid Sharif al-Husaini	Drugs Drugs Drugs Contagious diseases Eye diseases Encyclopaedia of medicine
Exact period not known (around 18th and 19th centuries)	1. Muheet-a-Azam 2. Titles not known 3. Talif-i-Sharifi	Hakim Alam Khan 1. Mirza Mohammad Hashim Alawi Khan 2. Hakim Shaikh Qulam Mustafa Muradabadi Hakim Sharif Khan	Last effort to popularize Unani medicine in India, with Hindi equivalents, which suited to the local people.

(Dates of rulers 10 to 19 not known)

APPENDIX IV

STAGES IN THE DEVELOPMENT OF MEDICAL KNOWLEDGE IN MEDIEVAL INDIA

<u>STAGE</u>	<u>SUMMARY</u>	<u>PERIOD</u>	<u>DESCRIPTION</u>
I	TRANSLATION AND COMPILATION OF UNANI MEDICINE	1221-1352	Simple Translations alongside Medical Compendia and Compilations <u>initiated by Altamish, Alauddin Khilji, and Mohammad Tughlaq</u>
		1352-1388	<u>Institutionalized by Firoz Tughlaq</u>
		3588 - early 16th century	Unani medicine increasingly seen as inadequate - Sultanate rule
II	INTEGRATION OF UNANI WITH THE AYURVEDA	1526-1530	Integration initiated by Babur
		1530-1605	<u>Further institutionalisation of Compilation work (Akbar's rule).</u> Divided into a. Establishment of Bureau of Translation and Compilation b. Symbolic support in terms of special payment from the royal treasury - Purshigan.
III	MEDICAL PRACTICES AND TECHNIQUES ADVANCE	1605-1627 (throughout the 17th century)	<u>Medical knowledge in Integrated medicine highlighted (Jehangir's rule)</u> a. new forms of therapeutic measures focussed on i. importance of mercury in therapeutics ii. inclusion of Opium in the Indian Pharmacopoeia b. new forms of preventive aspects c. new forms of diagnosis re- established; Pulse examination for diagnosis made its appearance
IV	NEW FORM OF SYSTEMATISED KNOWLEDGE POPULARISED	Early 18th and 19th centuries -do-	<u>Efforts to popularize the new form of codified medicine</u> <u>And introduction in South India.</u>

Stages of Development of the Calcutta Medical College

Source: S.C. Seal, "History of Medical Education in India",
Ind.J.Pub.Hlth., 1(1), Oct. 1956, 37-67.

S.No.	Year Founded	Name of the Institution	Financed by - Govt./Private/Missionary/Municipality	Medium of Instruction	Standard	Qualification for Admission	Course - Diploma/Degree	Duration	Stages of Development (of the Institution)	Present Status
1	1835	Calcutta Medical College	Government	English	i) Graduate class for Europeans, Anglo-Indians & Indian Christians ii) Under-graduate for Military Asst. Surgeons Licentiate - 1839-73 Vernacular - 1860 Hindusthani - 1851-73 Bengali - 1851-73 Ceylon Classes - 1860 Mature Apothecary - 1860 Postgraduate	F.A. for M.B.; Entrance Exam for L.M.S. Test Exam for Europeans etc. under Matric. for Bengali classes	i) up to 1906 - M.B., L.M.S. ii) up to 1893 - V.L.M.S., N.A., Passed Hospital apprentice iii) Passed Hospital Asst. Military Asst. Surgeon After 1906 M.B. 5 yrs (now M.B.B.S.)	5 yrs. 3 yrs. 3 yrs.	1846 - recognized by Royal College of Surgeons, University of London & Society of Apothecaries, England 1847 - Military Sub-Medical Department opened 1857 - Affiliated to Calcutta University 1861 - Dentistry introduced 1865 - First Chair of Hygiene 1870 - Midwives training class opened 1873 - School classes transferred to Campbell Medical School 1874 - Graduates designated as Asst. Surgeon 1875 - Hindusthani classes transferred to Agra, Lahore and Patna 1881 - Lady students admitted 1892 - G.M.C. of Great Britain recognised the graduate degree of Calcutta Univ. 1894 - Military Students called Military Asst. Surgeon 1899 - Administrative Control transferred from D.P.I. to I.G. of Civil Hospitals 1906 - L.M.S. abolished;	Professional College for both graduate & post-graduate medical education in non-clinical & basic clinical & public health subjects

APPENDIX V (contd.)

S.No.	Year Founded	Name of the Institution	Financed by - Govt./Private/Missionary/Municipality	Medium of Instruction	Standard	Qualification for Admission	Course - Diploma/Degree	Duration	Stages of Development (of the Institution)	Present Status
2	1873	Campbell Medical School	Government	Vernacular (Bengali) to start with. English after 1895	Under-graduate school also compounders class under the State Med.Fac. of Bengal	Under Matric. for vernacular class; 1895-6 - Entrance exam. for English; 1910 - Matric. later Matric. & I.Sc.	V.L.M.S. (vernacular)) L.M.P. (mixed) vernacular or English) 1916 - L.M.F. (English))	3 yrs. 4 yrs.	1875 - opened by Lt. Governor John Campbell 1885 - Women students admitted 1895 - Course extended to 4 yrs. 1914 - Affiliated to the State Med.Faculty of Bengal 1948 - Upgraded to College standard 1895-6 - 4 years course introduced	1954 - School section abolished
3	1874	Dacca Med.Sch.	Government	Vernacular mixed with vernacular English after 1896	Do.	Originally - vernacular Middle Exam. 1895 - English Middle Exam. 1905-6 - Matric. 1916 - Matric. & later Matric. & I.Sc.	V.L.M.S. 1895-6 - L.M.P. 1916 - L.M.F.	3 yrs. 4 yrs.		Now in East Pakistan (Bangladesh)
4	1874	Temple Med.Sch.	Government	Vernacular (Hindi) to start with, now English	Under-graduate school	Originally - middle English & under Matric. later Matric. Exam.	L.M.P.	3 yrs.; later 4 yrs.	1916 - Affiliated to Behar & Orissa Medical Examination Board 1925 - Upgraded to College & School Section transformed to Darbhanga	1925 - Abolished
5	1923	Calcutta Medical School	Private - managed by a Registered Society	English	School	Matric. & I.Sc.	L.M.F. (State Med. Faculty of Bengal)	4 yrs.	1923 - founded by late Dr. K.S. Mallick 1924 - Affiliated to the SMF of Bengal 1948 - Amalgamated with the Nat.Med. Institute and upgraded to College.	1948 - School Course abolished

B I B L I O G R A P H Y

AHMED, S.U. "Urban Problems and Government Policies: A Case Study of the City of Dacca, 1810-1830" in K. Ballhatchet and J. Harrison (eds.), 1980, pp.129-165.

ANONYMOUS. "Hindu Medicine and Medical Education", Cal.Rev., 1865, 38 (LLXXXIII), pp.106-125.

ARNOLD, D.:

"Medical Priorities and Practice in Nineteenth-Century British India", S. As. Res., 1985, 5 (2), pp.167-183.

"Cholera in Colonial India" (unpublished), 1985.

AVINERI, S. Karl Marx on Colonialism and Modernisation, 1969, New York.

BAGAL, J.C. "Early Years of the Calcutta Medical College - Based on Educational Records", Mod.Rev., 1947, 82, pp.210-215.

BALLHATCHET, K. and J. HARRISON (eds.) The City in South Asia, 1980, London, Curzon Press.

BALA, P.:

"The Ayurvedic System of Medicine - Its Fate in Medieval India", Bull.Ind.Inst.His.Med., 1982, XII, pp.22-27.

"The Ayurvedic System of Medicine in Medieval India", Stud.His.Med., 1982, VI (4), pp.282-288.

BANERJEA, S.N. A Native in The Making, 1925, London.

BANERJI, D. "Place of the Indigenous and Western Systems of Medicine in the Health Service of India", Int.J.Hlth.Services, 1979, 9 (3), pp.511-519.

BARNES, B. "Introduction" in B. Barnes (ed.) Sociology of Science, 1972, London, Cox and Wyman, pp.9-16.

BASHAM, A.L. Wonder that was India, 1954, London, Sidgwick and Jackson.

BASU, A. The Growth of Education and Political Development in India, 1898-1920, 1974, Delhi, Oxford University Press.

BASU, B.D. History of Education under the Rule of the East India Company, 1867, Calcutta.

BAUMER, R.V.M. (ed.), Aspects of Bengali History and Society, 1976, New Delhi.

Bengal Chemical and Pharmaceutical Ltd., 1985, Calcutta (Report).

Bengal Despatches, Military Dept., 4 April 1832.

Bengal Despatches, Public Dept., Feb. 1831 - Dec. 1833.

BENENSON, A.S. "Infectious Disease" in S. Levine and A. Lilienfeld (eds.), pp.207-226.

BOSE, D.M. (ed.), A Concise History of Science in India, 1971, New Delhi, Indian National Science Academy.

BRASS, P. "The Politics of Ayurvedic Education: A Case Study of Revivalism and Modernization in India", in S.H. Rudolph and L.I. Rudolph (eds.), 1972, pp.342-371.

BRECKON, W. The Drug Makers, 1972, London, The Bowering Press.

BROOMFIELD, J.H. Elite Conflict in a Plural Society: Twentieth Century Bengal, 1968, Oxford University Press.

Calcutta University Commission Report, 1917-19, Vol.III and Vol.VII. Calcutta.

Caraka Samhita, 1949, trans. Shree Gulabkunverba Ayurvedic Society, Jamnagar, Vol.1.

CARTWRIGHT, F.F. A Social History of Medicine, 1977, London, Longman.

Census of India, 1921, Vol.V., Pt.I.

Centenary Volume of the Medical College, Bengal: 1835-1934, 1935, Calcutta.

CHAKRAVARTI, K.C. Ancient Indian Culture and Civilization, 1961, Bombay, Vora.

CHANDPURI, K. "Fawa'id Al-Insan: A Rare Manuscript of Akbar's time", Stud.His.Med., 1977, 1 (2), pp.122-128.

CHANDRA, B., A. TRIPATHI and B.DE. Freedom Struggle, 1972, Delhi, National Book Trust.

CHARLESWORTH, N. British Rule and the Indian Economy, 1800-1914, 1982, London, MacMillan Press.

CHATTOPADHYAYA, D.P.:

What is Living and What is Dead in Indian Philosophy, 1976, New Delhi.

Science and Society in Ancient India, 1977, Calcutta, Jayatri Ghosh.

CHOPRA, R.N. Indigenous Drugs of India - their medical and economic aspects, 1933, Calcutta.

CRAWFORD, D.G. A History of the I.M.S.: 1600-1913, 1914, Vol.II, Calcutta, W. Thacker and Co.

CROZIER, R. "Medicine and Modernization in China", Comp.Stud.Soc. and His., 1970, 12, pp.275-291.

Dainik Bharat Mitra, 25-30, Nov. 1915, Calcutta.

DASGUPTA, S.N. A History of Indian Philosophy, 1952, Cambridge, Cambridge University Press, Vol.II.

DAVIS, K. Population of India and Pakistan, 1951, Princeton.

DESAI, A.R. Social Background of Indian Nationalism, Bombay, Popular Prakashan.

DUNN, F.L. "Traditional Asian Medicine and Cosmopolitan Medicine as Adaptive Systems" in C. Leslie (ed.) Asian Medical Systems, pp.133-158.

DUTT, N. Mahayana Buddhism, 1977, Delhi, Motilal Banarsidass.

DUTT, R. The Economic History of India in the Victorian Age from the Accession of Queen Victoria in 1837 to the Commencement of the Twentieth Century, 1956, 8th impression.

DUTT, U.C. The Materia Medica of the Hindus, 1877, Calcutta.

EATWELL, W.C.B. "On the Rise and Progress of Rational Medical Education in Bengal", Medical Tracts: 1839-1879, 1880, pp.1-28.

Edn. Hlth. and Lands:

July 1919, nos. 26-51.

N.A.I., Feb. 1925, 3-22 A.

N.A.I., Sept. 1926, 26-31A, N.A.I.

Extract from the Report of the General Committee of Public Instruction, 1833, Vol.12, pp.32-37.

FARRINGTON, B. Head and Hand in Ancient Greece, 1947, London.

FILLIOZAT, J. The Classical Doctrine of Indian Medicine, 1964, New Delhi, Oriental Publishers.

FRAZER, W.M. A History of Public Health: 1834-1939, 1950, London, Tindall and Cox.

GADGIL, D.R. Industrial Evolution in India in Recent Times, 1860-1939, 1971, Delhi, Oxford University Press. (Book Review by Ume Jan Woltemade, J.As.Stud., 1973-74, 33 (1), pp.143-144).

GARRISON, F.H. An Introduction to the History of Medicine, 1913, London, W.B. Saunders.

GERTH, H.H. and C. WRIGHT MILLS (eds.), From Max Weber: Essays in Sociology, 1958.

GHOSH, J.C. Indigenous Drugs of India: Their Cultivation and Manufacture, 1918, Calcutta.

GORDON, B.L. Medicine throughout Antiquity, 1949, Philadelphia, F.A. Davis.

GRAY, N. "Bengal and Britain: Culture Contact and the Reinterpretation of Hinduism in the Nineteenth Century" in R.V.M. Baumer (ed.), 1976, pp.99-131.

GREENOUGH, P.R. "Variolation and Vaccination in South Asia c.1700-1865", So.Sc.Med., 1980, xiv, pp.345-347.

GRIFFITHS, P. The British Impact on India, 1952.

GUPTA, B. "Indigenous Medicine in Nineteenth and Twentieth-Century Bengal", in C. Leslie (ed.) 1976, pp.368-378.

HABIB, I. The Agrarian System of Mughal India: 1556-1707, 1963, New Delhi, Asia Publishing House.

Half-Yearly Reports of the Government Charitable Dispensaries, Bengal Medical Dept., Aug. 1840 - Jan. 1842.

HALDAR, J.R. Medical Science in Pali Literature, 1977, Calcutta.

HALMOS, P. (ed.) Professionalisation and Social Change, 1973, University of Keele.

HARRISON, J.B. "Allahabad: A Sanitary History" in K. Ballhatchet and J. Harrison (eds.), 1980, pp.167-195.

HEHIR, P. The Medical Profession in India, 1923, London.

Hitavadi, 2 Dec. 1915, Calcutta.

HUME, J.C.:

Medicine in the Punjab, 1849-1911: Ethnicity and Professionalisation in Control of an Occupation, 1977 (Ph.D Thesis, Duke University).

"Rival Traditions: Western Medicine and Yunani-Tibb in the Punjab, 1849-1899", Bull.His.Med., 1977, 51, pp.214-231.

Hundred Years of the University of Calcutta, 1957, Calcutta, D. Chakrvariti.

India and Bengal Despatches:

Public Letter, July 1834

Public Letter, 1835

India Public Consultations, 25 - 10 Oct. 1846.

Indian Constitutional Reforms: The Montagu-Chelmsford Proposals - Report by the Secretary of State and the Viceroy, 1918, John Murray.

Indian Medical Congress - Report, 1894.

Indian Medical Gazette, 1921, Vol.56.

Indian Medical Proceedings, 1873-75.

Indian Sanitary Proceedings, 1871, Vol. 6714, Progs. 4-5.

ISRAILI, A.H. "Education of Unani Medicine during Mughal Period", Stud.His.Med., 1980, 4(3), pp.177-182.

JACKSON, B. "From Papyri to Pharmacopoeia" in F.N.L. Poynter (ed.), The Evolution of Pharmacy in Britain, 1965, pp.151-164.

JAGGI, O.P. "Indigenous Systems of Medicine during British Supremacy in India", Stud.Hist.Med., 1977, 1 (4), pp.320-347.

JALIL, A. "Evolution and Development of Greco-Arab Medical Education", Stud.His.Med., 1978, II (3), pp.190-197.

JEFFERY, R.;

"Allopathic Medicine in India: A Case of Deprofessionalisation?", So.Sc. and Med., 1977, 11, pp.561-573.

"Recognizing India's Doctors: The Institutionalization of Medical Dependency (1918-39)", Mod.As.Stud., 1979, 13 (2), pp.301-326.

"Indian Medicine and the State", Bull.Br.Assocn.Orientalists, 1979-80, 11, pp.58-71.

Health and the State in India, 1985. (Ph.D Thesis, University of Edinburgh).

JEPHSON, H. The Sanitary Evolution of London, 1967.

JOHNSON, T.J.:

Professions and Power, 1972, London, British Sociological Association.

"Imperialism and the Professions", in P. Halmos (ed.), 1973, pp.281-309.

JOLLY, J.:

Indian Medicine,

"Physicians and Therapy", in D.P. Chattopadhyaya (ed.), Studies in the History of Science in India, Vol.1, pp.175-208.

JOSHI, L. Studies in the Buddhistic Culture of India, 1964, Delhi, Motilal Banarsidass.

KESWANI, N.H.:

Medical Education in India since Ancient Times, 1968. (A talk presented at the International Symposium held at California).

The Science of Medicine and Physiological Concepts in Ancient and Medieval India, 1974, New Delhi, S.K. Manchanda.

"Medical Heritage of India", in N.H. Keswani (ed.), The Science of Medicine, 1974.

KHAN, I.A. "The Middle Classes in the Mughal Empire", So.Sc., 1976-77, 5 (1), pp.28-49.

KLEIN, I. "Death in India, 1871-1921", J.As.Stud., 1973, XXII (4), pp.639-659.

KNOWLES, D.D. "Religious Life and Organization", in A.L. Poole (ed.), Medieval England, 1958, Oxford, Vol.II.

KOMAN, M.C. Report on the Investigation of Indigenous Drugs, 1921.

KOPF, D.:

British Orientalism and the Bengal Renaissance, 1969, Berkeley, University of California Press.

"A Bibliographic Essay on Bengal Studies in the U.S.", in R.V.M. Baumer (ed.), 1976, pp.200-243.

KUMAR, D. Land and Caste in South India, 1965, Cambridge, Cambridge University Press.

KUTUMBIAH, P.:

"Medicine in Medieval India", Ind.J.His.Med., VII, 1, 1962, pp.1-13.

Ancient Indian Medicine, 1962, Madras, Orient Longmans.

LESLIE, C.:

"Modern India's Ancient Medicine", Transactions, 1966, pp.46-55.

(ed.), Asian Medical Systems: A Comparative Study, 1976, London, University of California Press.

"The Ambiguities of Medical Revivalism in Modern India", in C. Leslie (ed.), Asian Medical Systems, pp.356-367.

LEVINE, S. and A. LILIENFELD (eds.), Epidemiology and Public Health.

LEWIS, R. and A. MAUDE Professional People, 1952, London, Phoenix House.

MACNAMARA, C. A History of Asiatic Cholera, 1876, London.

MAHMOOD, S. A History of English Education in India, 1895, Aligarh.

MAJOR, R.H., A History of Medicine, 1954, Oxford, Blackwell.

MAJUMDAR, R.C. "Medicine", in D.M. Bose (ed.), 1971.

MATHEWS, L.G. History of Pharmacy in Britain, 1962, Edinburgh, E. and S. Livingston.

MAYHEW, A. The Education of India, 1926, London, Faber and Gwyer.

McGREW, R.E. "The First Cholera Epidemic and Social History", Bull.His.Med., 1960, XXIV, pp.61-73.

McGUIRE, J. The Making of a Colonial Mind: A Quantitative Study of the Bhadratokk in Calcutta: 1857-1885, 1983, Australian National University.

MEHTA, P.M. "History of Indian Medicine", in P.S. Sharma (ed.), Realms of Ayurveda, 1979, New Delhi, Arnold Heinemann, pp.47-85.

Memorandum on the Progress of Education in India, 1916 and 1926, 1928.

MERTON, R.K., "The Institutional Imperatives of Science", in B. Barnes (ed.) Sociology of Science, 1972, Middlesex, Penguin Books Ltd., pp.65-79.

METCALF, B.D. "Nationalist Muslims in British India: The Case of Hakim Ajmal Khan", Mod.As.Stud., 1985, 19 (1), pp.1-28.

MILLERSON, G. The Qualifying Associations, 1964, London, Routledge and Kegan Paul.

MISRA, B.B. The Indian Middle Classes: Their Growth in Modern Times, 1961, London, Oxford University Press.

MITRA, J. A History of Medicine from pre-Mauryan to Kusana Period, 1974, Varanasi, Jyotirlok Prakashan.

New Calcutta Directory for 1857, 1857, Calcutta, Pt.VI.

NICHOLAS, R.W. "The Goddess Sitala and Epidemic Smallpox in Bengal", J.As.Stud., 1981, xli, pp.21-44.

Parliamentary Papers, East India Company, 1894, Vol.LX and 1914, Vol.LXiii.

PARSONS, T.:

The Social System, 1952, London, Routledge and Kegan Paul.

Essays in Sociological Theory, 1954, Illinois, Free Press.

Pharmaceutical Journal, 9 May 1917.

PRANDY, K., A. STEWART and R.M. BLACKBURN, White-Collar Unionism, 1983, London, MacMillan Press Ltd.

Proceedings of the Conference of Provincial Representatives, 24-30, June 1930, Simla.

Proceedings of the Bengal Legislative Council, Jan.-Dec. 1918.

Proceedings of the Bengal Municipal Department, Medical Branch, 1891.

Proceedings of the Government of Bengal:

Financial Department, Medical Branch:

nos. 58-62, March 1862.

nos. 74-75, July 1869.

nos. 5-7, Feb. 1873.

Proceedings of the Government of Bengal:

Home Department, Medical Branch, 7 Jan. - 25 March 1871.

Proceedings of the Government of Bengal:

Municipal Department, Medical Branch, Jan. 1911.

Proceedings of the Government of Bengal:

Local Self-Government Department, Medical Branch, 20-8, Dec. 1915.

Proceedings of the Government of India:

Home Department, Medical Branch,

1 April 1822 - 27 June 1822.

Sept. - Oct. 1837.

July - Dec. 1860.

July - Dec. 1866.

14-45B, Aug. 1901.

11 Aug. 1906.

75-77A, June 1907.

98-99B, July 1910.

Sept. - Oct. 1937.

Proceedings of the Governors of the Native Hospital relative to the Establishment of a Fever Hospital, 1838, in Arnold, 1985.

Quinquennial List of Registered Ayurvedic Practitioners, from 1352 to 1356 B.S.

Quinquennial Review on the Progress of Education in India, 1917-22, 1923, Calcutta.

RAMASUBBAN, R. Public Health and Medical Research in India - their Origins under the Impact of British Colonial Policy, 1982, SAREC Report.

RAWAT, P.L. History of Indian Education, 1968, Agra, Ram Prasad.

READER, W.J. Professional Men, 1966, London, Weidenfeld and Nicolson.

Report of the Committee of Public Instruction for the year 1839-40, Bengal.

Report on Medical Education at the Vernacular Medical School, Sealdah, by the Committee appointed to enquire into the Medical Expenditure in Bengal, 1879, Bengal.

Report on the Administration of Bengal, 1890 to 1891, Calcutta.

Report of the Proceedings of the Central Indigenous Drugs Committee of India, Calcutta, 3 Jan. 1896 - 21 July 1899, Vol.1.

Report on the Indian Newspapers and Periodicals in Bengal, Jan. - Dec. 1915.

Report of the All India Ayurvedic Conference and Exhibition held at Madras, 1916.

Report of the Drugs Inquiry Committee, 1930-31, Madras.

Report of the Health Survey and Planning Committee, 1962, Delhi, Vol.I.

ROSENBERG, C.E. "Cholera in Nineteenth-Century Europe: A Tool for Social and Economic Analysis", Comp.Stud.Soc.His., 1966, viii, pp.451-463.

RUDOLPH, S.H. and L.I. RUDOLPH (eds.) Education and Politics in India, 1972, Cambridge, Harvard University Press.

Rules and Regulations of the Medical College in the Presidency of Bengal, 1860, Calcutta.

SANIAL, S.C. "History of the Press in India", Cal.Rev., 1911, CXXXII.

Sanjivani, 2 Dec. 1915, Calcutta.

SARBADHIKARI, K.C.:

"The Early Days of the First Medical College in India", Ind.J.Med.Edn., 1961, 4, pp.293-298.

"Western Medical Education during the Early Days of British Occupation", Ind.J.His.Sc., 1961, 32.

SEAL, S.C. "History of Medical Education in India", Ind.J.Pub.Hlth., 1956, 1 (1), pp.37-67.

Selections from Educational Records, 1854, Calcutta.

SEN, S.N. "A Survey of Source Materials" in D.M. Bose (ed.), 1971.

SHRYOCK, R.H. The Development of Modern Medicine, 1947, New York, Alfred Knopf.

SIGERIST, H. A History of Medicine, 1961, New York, Oxford University Press, Vol.II.

SIDDIQUI, T. "Unani Medicine in India", Ind.J.His.Sc., 1981, 16 (1), pp.22-25.

SINTON, J.A. "What Malaria Costs India", Hlth.Bull., 1956, no.26, GOI.

SLEEMAN, W.H. Rambles and Recollections of an Indian Official, 1844, Vol.1, London.

STEINTHAL, B. The Ayurvedic Revivalist Movement in Early Twentieth-Century British India, 1984. (Master's Thesis, Harvard University, Cambridge, Massachusetts).

SUBBARAYAPPA, B.V. "Western Medicine in India up to the end of the Nineteenth Century", in D.M. Bose (ed.), 1971, pp.184-567.

THAPAR, R. A History of India, 1966, Penguin, Vol.I.

THOMPSON, C.J.S. The Mystery and Art of the Apothecary, 1929.

TREASE, G.E. Pharmacy in History, 1964, London, Tindall and Cox.

VERMA, R.L. and N.H. KESWANI, "Unani Medicine in Medieval India: Its Teachers and Texts" in N.H. Keswani (ed.) The Science of Medicine and Physiological Concepts in Ancient and Medieval India, 1974, New Delhi, S.K.Manchanda.

WAGLE, N. Society at the Time of Buddha, 1966, Bombay, Popular Prakashan.

WILCOCKS, C. Medical Advance, Public Health and Social Evolution, 1965, London.

WILSON, R.N. The Sociology of Health: An Introduction, 1970, New York, Random House.

WOODRUFF, P. The Men Who Ruled India, 1954, London.

ZAHOORI, M.A. Al-Wahhab, "The Achievements of the Indian Physicians", Stud.His.Med., 1979, III (1) pp.49-68.